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Skeptical Inquirer™

THE MAGAZINE FOR SCIENCE AND REASON

Volume 32, No. 2 • March/April 2008 • INTRODUCTORY PRICE U.S. and Canada $4.95

THE NEW CHINA

CFI In China

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Paul Kurtz

Let's Cool It on Global Warming
Bjorn Lomborg

Gary Schwartz's 'Energy Healing'
Harriet Hall

Largest Test of Astrology
David Voas

Martin Gardner on *The Physics of Christianity*

Published by the Committee for Skeptical Inquiry

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The SKEPTICAL INQUIRER (ISSN 0194-6730) is published bimonthly by the Committee for Skeptical Inquiry, 3965 Rensch Road, Amherst, NY 14228. Printed in U.S.A. Periodicals postage paid at Buffalo, NY, and at additional mailing offices. Subscription prices: one year (six issues), $35; two years, $60; three years, $84; single issue, $4.95. Canadian and foreign orders: Payment in U.S. funds drawn on a U.S. bank must accompany orders; please add US$10 per year for shipping. Canadian and foreign customers are encouraged to use Visa or MasterCard. Canada Publications Mail Agreement No. 41153509. Return undeliverable Canadian addresses to: IMEX, P.O. Box 4332, Station Rd., Toronto, ON M5W 3J4.

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Subscriptions and changes of address should be addressed to: SKEPTICAL INQUIRER, P.O. Box 703, Amherst, NY 14226-0703. Or call toll-free 1-800-634-1610 (outside the U.S. call 716-636-1425). Old address as well as new are necessary for change of subscriber's address, with six weeks advance notice. SKEPTICAL INQUIRER subscribers may not speak on behalf of CSI or the SKEPTICAL INQUIRER.

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Twenty years of CSI and CFI interactions with China help reinforce Chinese scholars' efforts in boosting scientific understanding and attaining some degree of harmony in a complex country grappling with an incredible development boom. It is in our interests to continue to work closely with the Chinese, and we intend to do so.

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Cover: The Oriental Pearl Tower, Shanghai. Credit: Jonathan Larsen

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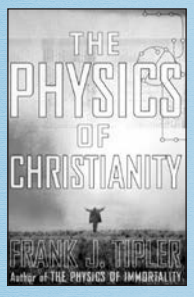

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Editor's Note

The Force of Change in China

Our founder Paul Kurtz and I present two reports on China in this issue. They arise out of a stimulating world congress our Center for Inquiry/Transnational sponsored in Beijing on "Scientific Inquiry and Human Well-Being"; a six-day post-conference tour to Xi'an, Guilin, and Shanghai; and special visits to science museums and exhibit centers and meetings with Chinese science leaders. We were impressed with China's rapid modernization, its astonishing economic growth, its embrace of science and technology, and the warmth and civility of its people. We also saw firsthand the reasons for great concern about environmental degradation and sustainability. We think it is wise that CFI, the Committee for Skeptical Inquiry, and the SKEPTICAL INQUIRER have established a permanent presence in China, an economic powerhouse with enormous potential and problems and a host of young scholars deeply interested in the popularization, appreciation, and application of science.

* * *

Also in this issue, Copenhagen economist Bjorn Lomborg, of *Skeptical Environmentalist* fame, gives his invited take on the issue of climate change and global warming and how best to deal with it. Physician Harriet Hall strongly disputes the latest claims of professor Gary Schwartz and his "energy healing experiments." Schwartz was the subject of an SI cover critique by Ray Hyman of his previous "afterlife experiments," SI, January/February 2003. Judging from Hall's new report, Schwartz hasn't mended his gullible ways. David Voas, a University of Manchester professor of population studies, describes his test of astrology, the largest ever undertaken. During our three-plus decades we have published many empirical tests of astrology, but none involving data on *ten million* marriages! We also think you will enjoy Martin Gardner's spirited takedown/sendup of Frank Tipler's *The Physics of Christianity.* And much, much more.

* * *

The widely heralded discovery that human skin cells can be reprogrammed to behave like embryonic skin cells may be one of those refreshing cases where science defuses an ethical and moral controversy by actually changing and improving the available options. It is a welcome development, but the issue itself hasn't disappeared. As retiring *Science* magazine editor Donald M. Kennedy notes in an editorial (Dec. 21), "That controversy was generated by specific objections from one religion, not some universal ethic. There is every reason to continue research along the old path, with embryo-derived cells: The new methods may carry unknown liabilities, so making the case for changing Bush's 2001 presidential order should continue."

* * *

Prospective SI authors: In this issue (p. 56) we have significantly updated and expanded our Guide for Authors. Posted on our Web site at www.csicop.org/si/guide-for-authors.html, it should answer most questions. We encourage submissions meeting the guidelines from knowledgeable scientists, scholars, writers, and investigators.

—KENDRICK FRAZIER

Skeptical Inquirer
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The Comic Pratfalls of Richard Roberts

MARTIN GARDNER

Lay not up for yourselves treasures upon earth where moth and rust cloth corrupt and where thieves break through and steal.

—Jesus, Matthew 6:19

In November 2007, Oral Roberts's singing son Richard, age fifty-nine, resigned as president of Tulsa's Oral Roberts University (ORU). For fourteen years, his presidency has been a Tulsa joke. Now three former university professors are suing Richard and ORU for allegedly illegally using university funds to maintain the lavish lifestyle of Richard and his second wife Lindsay. Three somewhat similar lawsuits have since been filed by individuals.

On Thanksgiving Day Richard said that although he was completely innocent of all charges, God told him to resign. As all Tulsans know, God often speaks directly to Richard and his father. On his television show, Richard routinely receives from the Lord what Pentecostals call the "word of knowledge." Richard will typically say, "There is someone watching this broadcast who is slowly losing her sight because of cataracts. God is healing your eyes at this very moment! Praise the Lord!"

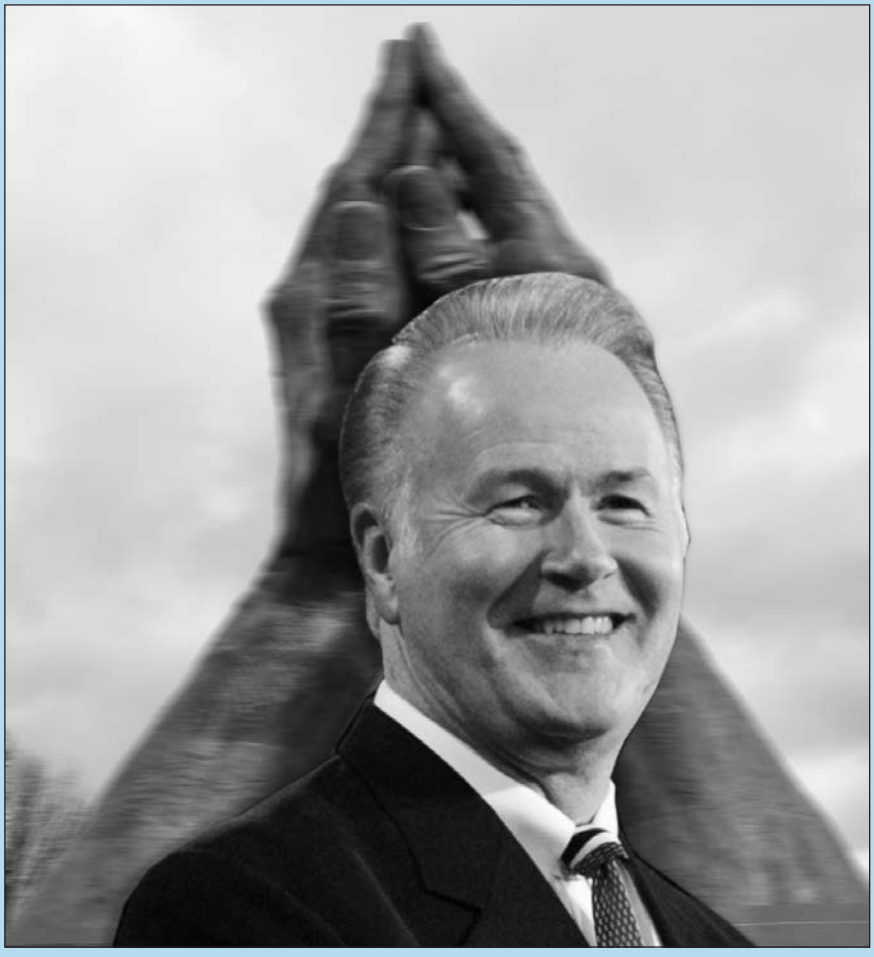
In the early 1960s God said to Oral, "Build me a university." After ORU was built, God spoke again: "Oral, build me a hospital." While the medical complex, which Oral called the City of Faith, was under construction, Oral had a vision of a 900-foot-tall Jesus. "He stared at me without saying a word. Oh, I will never forget those eyes. He reached down his hands under the City of Faith, lifted it, and said to me 'See how easy it is for me to lift it!'" Posters went up near the site of the vision. "Begin the 900-foot Jesus Crossing," they warned.

What Tulsa didn't need was another hospital. Over the years, rooms at the City of Faith were mostly empty until Oral was finally forced to turn the hospital into an office building. Apparently God had given him bad advice.

Two enormous bronze praying hands stand on the ORU campus. One of the best of many Tulsa jokes about ORU tells of a time when a small earthquake toppled the hands. A construction crew was struggling vainly to get the hands upright when a man approached the foreman and said, "If you give me a quarter I'll show you how to get those hands back up." Amused, the foreman handed the man a quarter. He tossed it toward the hands. They instantly jumped up to grab it.

In 1987, Oral was back in the news. God told him he would call him home if he failed to obtain millions of dollars to pay off a mounting debt soon. Bumper stickers appeared all over town saying "Send Oral to heaven in '87." Sure enough, a whopping check from a Florida dog racetrack owner saved the day.

ORU is currently struggling to erase a debt of $50 million. In spite of this debt, Richard has allegedly been siphoning cash from ORU for years to support an outlandish lifestyle. University funds have supposedly been used for eleven costly remodelings of his mansion. Lindsay's closet is the size of a bedroom. In less than a year, she spent tens of thousands of dollars on clothes from a Tulsa store alone. She drives a white Lexus SUV and a red Mercedes convertible, both bought, maintained, and fueled, critics say, by ORU. A private jet owned by the university is



Richard Roberts

used only by Richard, his family, and his friends. It is also believed that ORU paid $29,411 for the vacation of a daughter and her friends to Orlando, Florida, and to the Bahamas. It bought and maintains a stable of horses for Richard's three daughters and phone bills for the family, all allegedly paid by ORU, run to $800 a month.

According to a document submitted by the three plaintiffs, "As of 2003 Richard Roberts was compensated at the following levels—$181,469 annual salary from ORU; in excess of $100,000 as vice-president of City Plex, and an additional $41,530/year from the Oral Roberts Evangelistic Association." *The Oklahoman* (October 21, 2007) reported that in 2005 Lindsay, executive vice-president of the Association, was paid $77,012 by the Association and $119,800 by its subsidiary Trico Advertising. In 2006 Oral Roberts received $83,505 as the Association's trustee.

Richard's first wife Patti did not appreciate Richard's assurance, which he got from his father, that God has no objection to enormous wealth and conspicuous waste. Does not the 23rd Psalm say "I shall not want"? Yes, and the gospels tell how Jesus advised a rich, young man to sell his possessions and give the money to the poor, and that Jesus said it was easier for a rope (the Aramaic word for camel is the same as the word for rope) to go through a needle's eye than for a rich man to enter heaven. After Patti divorced Richard, she wrote a book titled *Ashes to Gold* that draws a grim picture of Richard and their stormy marriage.

The lawsuit filed by the three professors alleges that twenty-nine photographs exist of Lindsay sitting in her sports car after midnight with a sixteen-year-old boy and smoking cigarettes. Several persons described the boy as Lindsay's "boyfriend." The lawsuit points out that Tulsa has a 10 P.M. curfew for all teenagers not in the company of their parents. I have no idea if all this is true, or if it is, what to make of it. "Allegations against me in a lawsuit. . .are not true," Lindsay declared. "They sicken me to my soul."

Pentecostal evangelist Pat Robertson, a longtime friend of Oral, has made an undisclosed donation to help pay ORU's debt of $50 million. He has offered to pay more provided ORU cleans up its act.

It's hard to imagine anyone less qualified than Richard to run a university. True, he has a PhD degree. And what college gave Dr. Roberts his doctorate? Yes, you guessed it—ORU. An overwhelming majority of the ORU faculty are jubilant to see Richard go. At last the Lord seems to have given him good advice.

—Martin Gardner

Martin Gardner's latest book is The Jinn from Hyperspace *(Prometheus 2007), which includes several of his* SKEPTICAL INQUIRER *articles. He lives in Oklahoma.*

Science Leaders, CFI Call for Science Debate among Presidential Candidates

In December 2007 a coalition of scientists and science communicators began calling for a U.S. presidential debate devoted to science and technology, issuing a statement signed by over a dozen Nobel laureates, the chairman of the AAAS, the editor of *Science,* and the presidents of Princeton and Duke Universities, among many others. The statement, also signed by Center for Inquiry chairman Paul Kurtz and SKEPTICAL INQUIRER editor Kendrick Frazier, reads:

> Given the many urgent scientific and technological challenges facing America and the rest of the world, the increasing need for accurate scientific information in political decision making, and the vital role scientific innovation plays in spurring economic growth and competitiveness, we call for a public debate in which the U.S. presidential candidates share their views on the issues of The Environment, Health and Medicine, and Science and Technology Policy.

The idea is the brainchild of Matthew Chapman, a New York-based screenwriter, popular science author, and descendent of Charles Darwin. Chapman approached the Center for Inquiry/New York City for support, and the coalition grew swiftly from there. In just its first few weeks, the campaign was mentioned in *Wall Street Journal, Los Angeles Times, New Scientist,* Wired News, Salon.com, and ABCNews.com. In the first twenty-four hours, a group of more than forty science blogs joined the cause. Organizers hope to announce plans for a 2008 event. The public is invited to get involved at www.scienceddebate2008.com.

Born Again, Inc.: Senate Investigating Six Prophets for Profit

To one who had never made more than five thousand a year himself, it was inspiring to explain before dozens of popeyed and admiring morons how they could make ten thousand—fifty thousand—a million a year, and all this by the Wonder Power of Suggestion, by Aggressive Personality, by the Divine Rhythm, in fact by merely releasing the Inner Self-shine. . . .

—Elmer Gantry, by Sinclair Lewis

Tithe-happy televangelists and their luxurious lifestyles are once again facing scrutiny. The Senate Finance Committee is investigating six top prosperity preachers and their ministries' nonprofit status—a potential shield allowing millions to flow unchecked into some of those ministries.

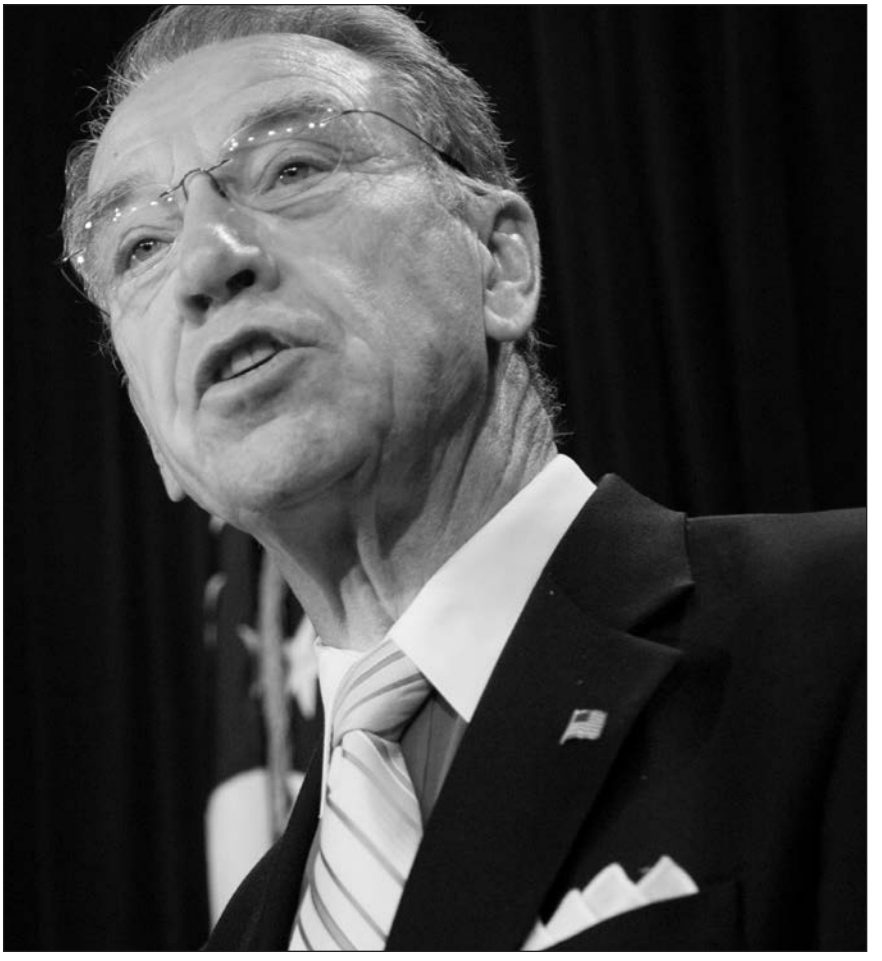
Senator Charles Grassley (R-IA), former chairman and ranking member on the Senate Finance Committee and avowed Christian, intends to hold these tax-exempt "churches" financially accountable. "I'm working to weed out the wrongdoers among the vast majority of do-gooders," Grassley said in a letter posted on the committee's Web site December 3. In fact, Grassley, who said he's not interested in discussing "doctrinal" issues in connection with this investigation, has a long history of calling nonprofits of all stripes to account.

"Whether it's using a private jet, driving a Rolls Royce or Bentley, or installing a $23,000 commode, there is obviously money going down the toilet," Grassley said in a letter about the probe.

The prosperity gospel has reached fever pitch among televangelists' elite cadre as their ministries flourish to the tune of billions—in fact, Americans give nearly $300 billion every year to charities, and many of those billions line the pockets of "faith-healers" like Benny Hinn, whose ministry is under investigation by Grassley. Churches, unlike most nonprofit organizations, don't have to file Form 990 with the IRS, a primary report requiring detailed income sources and expenditures.

The other five ministry leaders under investigation are Randy and Paula White of Without Walls International Church and Paula White Ministries of Tampa, Fla.; David and Joyce Meyer of Joyce Meyer Ministries of Fenton, Missouri; Kenneth and Gloria Copeland of Kenneth Copeland Ministries of Newark, New Jersey; Bishop Eddie Long of New Birth Missionary Baptist Church and Bishop Eddie Long Ministries of Lithonia, Georgia; Creflo and Taffi Dollar of World Changers Church International and Creflo Dollar Ministries of College Park, Georgia.

The fortuitously named Creflo Dollar, head of World Changers Ministries and its eighty million dollar yearly budget, said his church gave him a Rolls Royce as a gift. And he isn't ashamed of owning at least two mansions, including a posh Manhattan crib valued at $2.5 million, according to a *New York Times* report. Dollar also flies a little closer to heaven in his private Gulf Stream jet, one of two jets owned by his church. His ministry, however, gets an 'F' for financial transparency according to MinistryWatch.com, a faith-based group devoted to revealing



Senator Charles E. Grassley (Photo by Scott J. Ferrell/Congressional Quarterly)

the fiscal shenanigans of tax-exempt religious groups.

"Jesus came into the city of Jerusalem on a donkey," Grassley said in a telephone interview with the *Los Angeles Times*. "Do these ministers really need Bentleys and Rolls-Royces to spread the Gospel?"

Paula White, the popular, stiletto-healed, blonde bombshell preacher whom Donald Trump called "*All that,*" owns a $3.5 million condominium in New York's Trump Tower and recently purchased a half-million dollar home in San Antonio, Texas. When she was still married to husband Randy, the two arrived at their Without Walls church together in a blue Mercedes sedan.

A chic chameleon, White delivers financial advice with soft-spoken confidence, but preaches as if she was raised in the African American church tradition—her appeal among Blacks is huge. Trump's first-ever "Christian" television appearance explaining money-getting to the little people was on White's show. In response to questions about the senate probe from Larry King, White posed a question of her own: "Why is our faith being targeted as part of an inquiry?"

Grassley's letters to the six are extremely detailed requests for financial information, and although they follow a generic form, do get personal. In a letter to the Whites, he asks for proof of repayment of a personal loan of $170,000 from an elderly congregant. The loan, according to media reports, was nearly all of the life savings of a now very disenchanted Ruth McGinnis, who lives on a fixed income.

Grassley gave the ministries until Dec. 6 to respond to his request for proof of tax-exempt status, but only two ministries delivered materials to his office (Kenneth Copeland Ministries and Joyce Meyer Ministries) by the deadline, with Dollar and Long declining to volunteer any information, according to a report in the *Atlanta-Journal Constitution.*

Posted on Dollar's Web site (featuring no less than seven photos of himself in various poses on its home page) is the full text of the response sent to Grassley's office, which includes this comment:

> [W]e believe that the religious doctrine and practices of a church should not be held out for the world to evaluate as a result of responding to Congressional inquiries. We are concerned, for example, that some of the information requested would not be in the public domain even if churches were required to comply with these same filing requirements as other charitable organizations. In this instance, we are acutely aware of the potential for some members of the general public to disparage or belittle the Church's sincerely held religious beliefs, and we want to protect the Church and its members from this possibility.

Fond of focusing only on the scriptures appearing to support the prosperity gospel, many of the ministries in question ignore the cautionary maxims regarding wealth. Both the Old and New Testaments are clear about believers and their money: If you have it, share it.

"All the believers were one in heart and mind. No one claimed that any of his possessions was his own, but they shared everything they had . . . . There were no needy persons among them. (Acts 4:32, 34–35).

In fact, Dollar's eighty million alone could easily make a dent in alleviating the hunger of the approximately 24–27 million who receive emergency food assistance yearly in the United States. Stores in food pantries nationwide are at an all time low, according to recent news reports.

Regarding debt, Dollar says on his Web site: "Many years ago, God revealed to me that Satan wants Christians to remain heavily burdened by debt because it hinders their ability to finance the Kingdom of God. Think about it, if all your money is tied into bills, it will be difficult to support the church!" Besides, *somebody* has to polish Dollar's gold-domed church in Atlanta.

God also spoke to Kenneth Copeland at a convention in 2006 about prosperity. In a teaching/letter titled "Get Your Mind on the Harvest," in which he refers to Oral Roberts as his "spiritual father," Copeland says the Lord told him that:

"There are those of you that will begin to experience an outflow and overflow not only of anointing to minister to people, but in the financial realm also. And the increase will come not because of more work, or more effort on your part, but because of the intensified flow of the Holy Ghost. Not by might, not by any other way except by My Spirit, saith the Lord. . . . So jump in, jump in and enjoy the swim for the time has come."

Where do I sign on?

—Donna Budniewski

Donna Budniewski is an assistant editor for SI *and* Free Inquiry.

"Whether it's using a private jet, driving a Rolls Royce or Bentley, or installing a $23,000 commode, there is obviously money going down the toilet," Grassley said.

CFI Attacks Dismissal of Texas Educator for Her Pro-Evolution Actions

Scholars at the Center for Inquiry (CFI) were dismayed that the Texas Education Agency forced a distinguished educator out of her job because she spoke favorably of evolution and forwarded messages about lectures on evolution. Christine Castillo Comer, with more than three decades of experience as an educator, was recently forced out of her position as the state's director of science curricula after she forwarded an e-mail message about a talk to be given at CFI/Austin by Barbara Forrest, a critic of intelligent design. Forrest, a philosophy professor at Southeastern Louisiana University, is a fellow at the Center for Inquiry and of the Committee for Skeptical Inquiry.

CFI's director of research and legal affairs, Ronald A. Lindsay, said he believed Comer's legal rights may have been violated. "But regardless of the legality of the state's actions," he said, "it is incredible that in the twenty-first century an educator would be punished for saying something favorable about evolution. Does an educator have to be silent about the existence of pathogens or about [the] truth that the Earth revolves around the Sun and not vice-versa? It appears that the Texas Taliban now controls education in that state."

Forrest authored a position paper titled "Understanding the Intelligent Design Creationist Movement" released by CFI this past July. It's available online at http://www.centerforinquiry.net/uploads/attachments/intelligent-design.pdf. In the paper, she provided an insightful analysis of the intelligent design (ID) movement. She demonstrated convincingly that the ID movement is simply a continuation of Creationism. (Her related article "The 'Vise Strategy' Undone: *Kitzmiller et al. v. Dover Area School District*" was published in the January/February 2007 SKEPTICAL INQUIRER.)

Experts at CFI warn that Comer's recent experiences with authorities from the Texas Education Agency may indicate an insidious agenda on the part of certain parties within the Austin educational system to introduce students to intelligent design via the state science curriculum. Comer pointed out to the *New York Times* (December 2, 2007) that "state education officials seemed uneasy lately over the required evolution curriculum."

CFI chairman and founder Paul Kurtz said the foundations of our democratic society are now under attack. "The social and scientific progress we take for granted has been advanced by a basic scientific philosophical point of view: scientific naturalism," said Kurtz. "The methods of the sciences, and the assumptions upon which they are based, are being challenged culturally in the United States today as never before. Despite its success in providing us with unparalleled benefits, religious fundamentalists seek to inhibit free inquiry and to misrepresent the tested conclusions of scientific naturalism. This is a highly charged political issue—both science and secularism are under political attack. We seem not to have come far culturally since the Scopes 'monkey' trial if educators risk their jobs promoting academic lectures on scientifically uncontroversial topics."

Others likewise slammed the action. John Young of the *Waco Tribune-Herald* wrote a sarcastic column. "Imagine. Someone devoted to real science forwarding an e-mail about someone devoted to the same thing." This, he says, was "unfathomable . . . an offense that calls for termination."

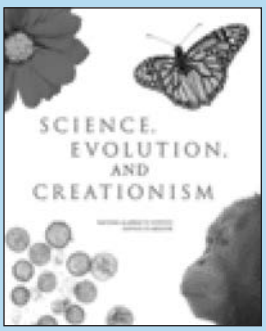
Eugenie Scott of the National Center for Science Education said Comer lost her job due to "the politicalization of science education." Steve Schafersman, president of Texas Citizens for Science, said Comer now joins the ranks of "martyrs of science, much like Galileo and Nickolai Vavilov," who was jailed by Stalinist Russia for studying genetics.

New National Academy Book Defends Evolution

In January, the National Academy of Sciences issued a new, spirited defense of evolution in the form of an updated, color-illustrated book, *Science, Evolution, and Creationism,* written for the lay reader in a popular style. It is a follow-up and update of previous editions issued by the Academy in 1984 and 1999 (SI, September/October 1999).

"The discovery and understanding of the processes of evolution represent one of the most powerful achievements in the history of science," it states. "Evolution successfully explains the diversity of life on Earth and has been confirmed repeatedly through observation and experiment in a broad spectrum of scientific disciplines. Evolutionary science provides the foundation for modern biology."

The new book gives new examples of evolutionary change discovered since the previous editions, emphasizes evolution's importance to medicine, and maintains that science and religion need not be in conflict. It says creationism and intelligent design are not science and should not be taught in the classroom. "The pressure to downplay evolution or emphasize nonscientific alternatives in public schools compromises science education. . . . The science curriculum should not be undermined with nonscientific material."



The seventy-two page book can be ordered for $11.65, read online, or downloaded free as a PDF file via the National Academies Press website, www.nap.edu

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The NEW FUTURE Fund

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– Jacob Bronowski, scientific polymath

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CSI Committee for Skeptical Inquiry

Toni Van Pelt, Paul Kurtz, and Ron Lindsay (standing); Lawrence Krauss, David Helfland, and Nobel Laureate Paul Boyer (seated) introduced the Declaration in Defense of Science and Secularism at the inaugural press conference of the Center for Inquiry/Office of Public Policy in Washington, D.C.

Local leaders, campus activists, and students from around the world came together at CFI's Summer Session.

Latin American and U.S. skeptical activists met at the CFI-sponsored First Iberoamerican Conference on Critical Thinking in Peru.

The new Naturalism Research Project will more than double our library facilities and create a collegial setting for scholarly dialogue and research.

Declaration Defends Europe's Genetically Modified Maize

In Europe, only one genetically modified (GM) plant variety is cultivated: the insect-resistant Bt GM maize. Even so, its cultivation is still very controversial. A European moratorium on Bt GM maize was in effect from 1997 to 2003, and despite the positive conclusions of independent commissions and scientific academies, opponents to the use of biotechnology in agriculture are still very aggressive, particularly in France. They seek to ban all GM food for humans and animals. Greenpeace and the well-known neoluddite José Bové are heavily lobbying both the French government and European commissioners.

The *Association Française pour l'Information Scientifique* (AFIS, the main French skeptical organization promoting scientific rationalism) took the initiative of drafting a declaration now signed by more than 500 scientists from French and European public research organizations.

These scientists affirm that any new plant variety, genetically modified or not, should be considered only on a case-by-case basis. They note, and specialized committees throughout the world agree, that the insecticidal active compound present in Bt GM maize has been exploited for decades by conventional and organic agriculture and gardeners without any observable toxic or allergic response.

In fact, Bt GM maize has been shown to contain lower levels of mycotoxins, which are carcinogenic substances. Additionally, available studies consistently indicate that the insect-resistant maize has a lesser environmental impact than the authorized insecticide treatment. Further, they note that the cohabitation of conventional, GM, and organic maize cultivation is possible and has been a reality for years in many countries.

The signatories state that the "No to GMO" campaign is based only on imaginary or false uncertainties concerning environmental or food safety: one may develop political, religious, pseudo-

scientific, esthetic, or whatever reason to support the case of a suspension of the Bt GM maize cultivation, yet there is no scientific basis for rejecting the crop.

More information on the declaration is available at http://nonaumoratoire.free.fr/english.htm.

—Michel Naud

Michel Naud is the president of l'Association française pour l'information scientifique (AFIS).

Natalee Holloway Disappearance Unsolved; Case Closed

Despite the efforts of countless searchers and psychics, police on the island of Aruba closed the case on missing teenager Natalee Holloway after two and a half years. On December 18, 2007, with no new leads and Holloway's body still missing, police said they had no choice but to end the investigation.

Holloway disappeared May 30, 2005, while on vacation in Aruba. Thousands of people joined the search, including tourists, Aruban police, U.S. Marines, and FBI officials. The island's ponds, beaches, ravines, forests, and landfills were all scoured, as Beth Holloway Twitty, Natalee's mother, consulted psychics and distributed flyers around the island. Tim Miller, leader of EquuSearch, an equestrian search team working to find Holloway, said that psychic information was both plentiful and invariably worthless. "To be honest, in Aruba we had 7,000 calls a day from these people. Nothing ever worked."

Since dozens of self-proclaimed psychic detectives claim to help police locate missing persons and solve crimes, it is strange that the case remains unsolved and that Holloway's body has never been found. Noreen Renier, perhaps America's best-known psychic, claims "uncanny success in finding missing persons," but refused to look for Holloway because no one from Holloway's family specifically asked for her help.

Carla Baron of the television show *Haunting Evidence* claims to have solved the case. When asked what she found out about the fate of Holloway, she replied, "I pretty much nailed it. . . . I knew whatever I was going to contribute was going to be poignant. I was willing to place myself in an area of danger and name names. I described in detail what happened—after I worked the case, there's nothing left to ponder. I'm crystal clear on this one." A post on Baron's Web site claims that Baron "also thinks she knows where Natalee Holloway is now." If Baron is "crystal clear" about Holloway's fate and knows where the missing teen is, perhaps she should provide this important information to police so her family can finally find closure.

—Benjamin Radford

Bad Journalism Misleads Public about Psychics

Ada Wasson and Mary Ellen Walters vanished, seemingly into thin air. The pair left their Warren County, Ohio, retirement home on April 19, 2007, for a day of shopping at an outlet mall. They never returned. Days turned into weeks and months with no clue about their fate. Their car was missing, their credit cards had not been used, and no one had reported seeing them. Police were puzzled, and their families were desperate. The case was widely publicized, attracting attention, sympathy, and of course psychics.

While the news media often report on a psychic's introduction into missing persons cases (always on their own initiative or at the family's request), reporters very rarely follow up to examine the accuracy of the information they provided. The result is a news bias in which the public hears about psychics being involved but doesn't hear about whether or not psychic information actually recovered the missing person or solved the case.

An earlier news report on Wasson and Walters was headlined "Psychic Aids in Search for Missing Women," despite the fact that the women had not been found, thus there was no way to know whether the psychic had in fact helped in the search. Giving wild guesses and incorrect information to police is hardly giving aid.

News of the women's recovery was reported in dozens of newspapers. Most dutifully reported on the story basics; the women were found, case closed. Only one enterprising journalist dug a little deeper and interviewed police about the information they received about Wasson and Walters from dozens of self-proclaimed psychics. The result was an excellent article headlined "Psychic Tips Were Off on Missing Women Case," by Deb Silverman, a reporter for WCPO in Cincinnati.

According to Silverman's report, police were contacted by about thirty psychics over the course of the six-month investigation. They sent maps, audiotapes, letters, dream journals, and e-mails. One supposed psychic said that the numbers forty-two and twenty-seven were significant and would help police find the missing women. Another said the pair would be found about five miles from where they were last seen; another said searchers should look in the Ohio River; still another said the women were within three hundred feet of a rural, white church somewhere. Thirty different "psychics" gave thirty different answers.

Online communities buzzed about the missing women, prompting many to offer their own psychic visions.

One woman wrote on a psychic prediction Web site:

> This is what I pick up. . . . Difficulties with a car, possibly a ruse by the perpetrators to get them to stop. Then I feel strongly something akin to violence or sudden act [*sic*], a deliberate hijacking of their car, violence, and then I feel the women laying dumped face down on an unpaved road . . . it is not where people normally would go to picnic. I sense two male individuals, in their twenties, were responsible. Stubble hair on face. Darkened skin, I feel that they were suntanned looking, but not black. Dark, full sort of eyebrows. Both have criminal records, one has a tattoo on arm, a dark bluish looking small tattoo with different colors, may be some type of eagle or dragon . . . something with long claws. One has very dark black hair, the other has dark hair. Facial hair on one is a bit of hair around chin near bottom lip perhaps, but not a huge amount, and longish, shoulder-length hair.

Another wrote that her deceased grandmother came to her in a dream the night of July 10, telling her that the grandmother was with Wasson and Walters "near water" somewhere in the town of Sedamsville, Ohio. The writer said that she had done a Web search on Sedamsville and discovered that there is a place called Eileen's Gardens near the town. She took this as a sign that the vision was accurate, since her grandmother's name was Eileen.

Wasson and Walters were found, but neither by psychics nor police. Their skeletal remains were spotted October 14 by a hunter and his son in a secluded field near Interstate 71 in Kentucky. One of the women was in the car, the other was nearby, apparently having tried in vain to reach the highway. There were no signs of foul play; the pair had missed their exit to the mall and tried to turn around but got lost on the country roads before driving into a dry creek bed where their car got stuck. Both were in poor health and neither had a cell phone.

All the information the psychics gave was wrong. The numbers, the tattooed killer, the dreams and visions, the locations, the river, the white church—every detail was not only completely wrong but wasted time and resources. Police spent about forty work hours sorting through the information and following up when possible. "The stuff is so general and so broad you don't have anywhere to start and you get all this information," Sgt. Brandon Lacy told Silverman. "They'll say it's by trees. It's by water. Well, that doesn't mean anything because there's millions of places in Ohio that have trees and water. . . . It's nice having people care so much and keeping the case alive, however it's a big waste of man hours."

The psychics are largely to blame, but journalists bear some responsibility. If more journalists covering missing persons cases provided context to their reporting and publicized psychics' consistent failures, perhaps fewer would waste police time and falsely raise the hopes of missing persons's families.

—Benjamin Radford

Benjamin Radford is managing editor of the SKEPTICAL INQUIRER.

Altercation with a (Criss) Angel

When NBC's new show *Phenomenon* began taping a mile away from the Center for Inquiry/Los Angeles, our home-grown Independent Investigations Group (IIG) took notice. The show advertised that it sought America's next great mentalist, and there would be a competition—à la *American Idol* (voting and all)—to see who would be crowned the next "phenomenon."

We weren't sure if the producers of the show considered the competitors performers or were treating them as having some sort of *real* powers—especially since longtime SKEPTICAL INQUIRER foe Uri Geller is one of them. So, we thought a closer look was in order and ordered tickets.

Geller appears on-camera along with magician Criss Angel as a commentator/judge of contestants vying for the title as best mentalist. Contestants compete until they are eliminated by phone and Internet voting. Angel, who has a show on A&E called *Mindfreak* where he performs big-time illusions, recently signed a giant contract with the Luxor Hotel in Las Vegas.

On Halloween night, IIGers Ross Blocher, Steve Muscarella, and I attended the taping of *Phenomenon* and were pleasantly surprised to witness a bit of an altercation between Angel and one of the performers. A guy named Jim Callahan performed a trick often called "automatic writing" where the mentalist claims to get information—in this case the identity or description of an item that was secretly placed in a box—from the "spirit" world. Callahan sat inside a ring of salt and after convulsing (while we laughed) for a few minutes, wrote down some words he supposedly got from the spirit of a dead author. Callahan claimed the author helped him identify the object in the box, a toy car. Applause, applause . . . judges, what do you think?

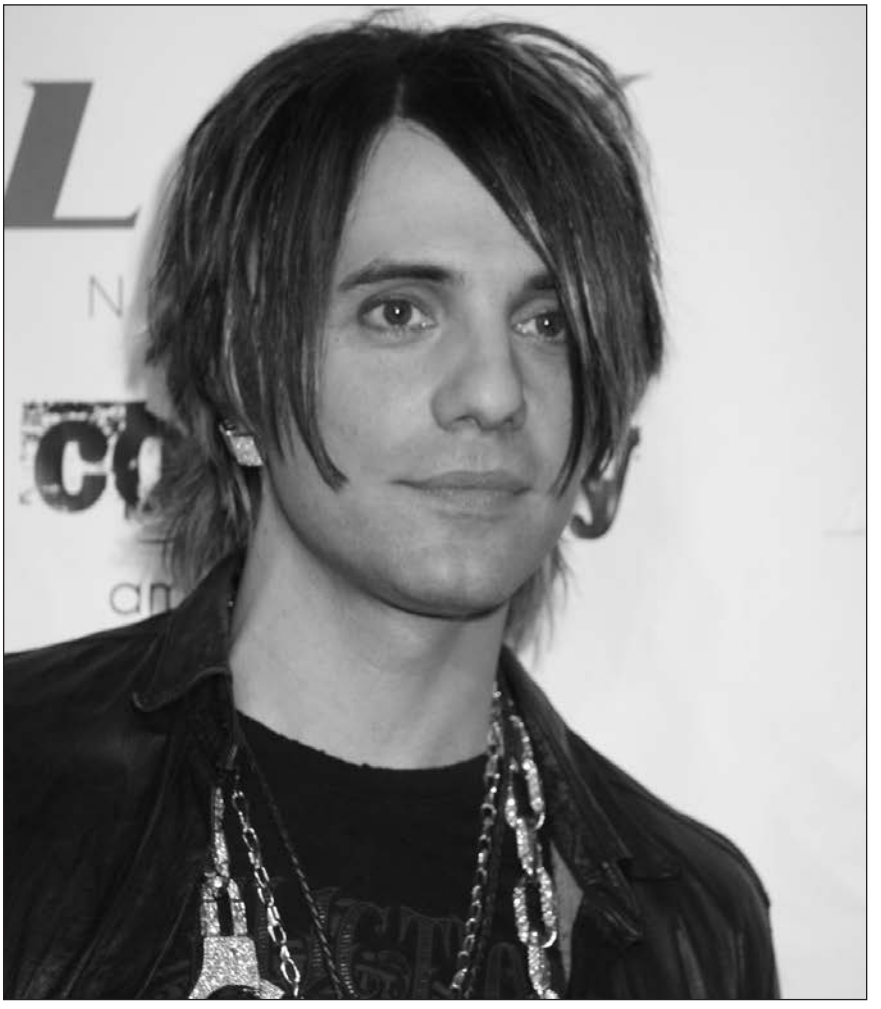
Geller, who professes to believe that spirits exist, went along with the stunt and complimented Callahan on his performance. When Angel was asked what he thought of the feat, he replied, "I just think it's comical quite frankly," and then proceeded to offer both Callahan and Geller a million dollars of his own money if they could guess the contents of two envelopes he pulled from his pocket. Neither "psychic" took Angel up on his seven-figure offer, but Callahan and Angel squared off on stage and had to be restrained.

OK . . . we didn't believe that fisticuffs were narrowly avoided, but there was no doubt that Criss Angel, *uber*-popular magician to an entire generation of young rock and rollers, had challenged not only contestant Jim Callahan but also the very *notion* of someone getting information from a spiritual world. Angel continued his assault off-camera during the commercial break and then warned audience members about paranormal fraud before leaving at the end of the show.

Skeptics should applaud Angel for defending the fine arts of mentalism and illusion while defying two promoters of the paranormal to put up or shut up. Keep up the good work, Criss.

—Jim Underdown

Jim Underdown is executive director of the Center for Inquiry/Los Angeles, and chair and founder of the Independent Investigations Group.



Criss Angel. Credit: Chris Connor / WENN [Photo via Newscom]

Two Meanings of 'Faith' Confuse Even Scientists

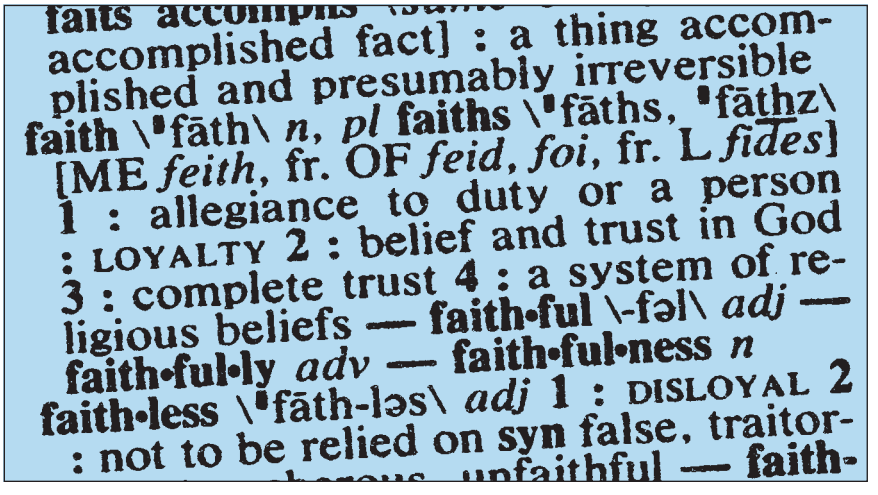
1. **Faith: the War between Science and Religion**

It's time we had a little talk. *The New York Times* published an op-ed by Paul Davies (November 24, 2007) that addresses the question: "Is embracing the laws of nature so different from religious belief?" Davies concludes that, "until science comes up with a testable theory of the laws of the universe its claim to be free of faith is manifestly bogus." Davies has confused two meanings of the word *faith*. The *Oxford Concise English Dictionary* on my desk gives the two distinct meanings for faith as: "1) complete trust or confidence, and 2) strong belief in a religion based on spiritual conviction rather than proof." A scientist's "faith" is built on experimental proof. The two meanings of the word *faith*, therefore, are not only different, they are exact opposites. Davies, who won the 1995 Templeton Prize, is not the only physicist to make that mistake. "Many people don't realize that science basically involves faith," Charles Townes said in his 2005 Templeton statement. On the topic of laser physics, I would happily defer to Townes, but this is a matter of the English language. Here we defer to the dictionaries. The judges who awarded Townes the 2005 Templeton Prize cited a single line from his 1966 article "The Convergence of Science and Religion": "Understanding the order in the Universe and understanding the purpose of the universe are not identical, but they are also not very far apart." They are a universe apart (http://bobpark.physics.umd.edu/WN05/wn031105.html). In any case, the "purpose" of the universe is not on the science agenda. Suicide bombers no doubt believe they are part of some divine "purpose."

On the topic of laser physics, I would happily defer to [Charles] Townes, but this is a matter of the English language. Here we defer to the dictionaries.

2. **The Faith War: What Connects Scientists of Faith?**

I count eight physicists among the thirty-four recipients of the Templeton Prize, and a couple more had degrees in physics. It was initially the Templeton Prize for Progress in Religion, and the first winner in 1973 was Mother Teresa. Winners have included Jews, Hindus, and Buddhists. Billy Graham got it in 1982, Charles Colson of Watergate fame in 1993, and Paul Davies in 1995. But in 1999, Ian Barbour, a student of Fermi, was the recipient. A professor of physics and theology at Carleton College, Barbour was credited with initiating a "dialog between science and religion." Templeton admired Barbour and coveted his dialogue. The scientific revolution, after all, led to the fantastic growth in the world economy that made him a billionaire. Templeton believes God has chosen him to show the world that, as he puts it, theology and science are two windows on the same landscape. So he changed the name to the Templeton Prize for Research or Discoveries about Spiritual Realities. It is the largest prize for intellectual accomplishment in existence, specifically chosen to be bigger than the Nobel. Since that time, six of the last eight winners of the Templeton Prize have been physicists. They all relied on the anthropic principle in their Templeton Prize statements.


faits accompli [accomplished fact] : a thing accomplished and presumably irreversible
faith \'fāth\ *n, pl* faiths \'fāths, 'fāthz\ [ME *feith*, fr. OF *feid, foi*, fr. L *fides*] 1 : allegiance to duty or a person : LOYALTY 2 : belief and trust in God 3 : complete trust 4 : a system of religious beliefs — faith•ful \-fəl\ *adj* — faith•ful•ly *adv* — faith•ful•ness *n*
faith•less \'fāth-ləs\ *adj* 1 : DISLOYAL 2 : not to be relied on syn false, traitorous, unfaithful — faith-

3. **Anthropic Principle: Some Think It Proves There Is a God**

It argues that the universe has been "fine-tuned" to make life possible. In the so-called strong form: "The fundamental parameters of the universe are such as to permit the creation of observers within it." I believe an equivalent wording would be: "If things were different, things would not be the way things are."

—Robert L. Park

Robert Park is professor of physics at the University of Maryland and a CSI Fellow. This is from his weekly What's New *electronic newsletter, with permission.*

Quoteworthy

Evolution in Action: Nonhumans

"Recent research by Ben Phillips and his collaborators at the University of Sydney has shown that the toads [imported to Australia from Central America] are evolving as they spread, perfecting their ability to adapt to the Australian landscape. The toads at the front edge of the invasion now have smaller bodies, reduced toxicity, and relatively longer legs, apparently because individuals with those traits were having greater success. . . . Such examples are changing scientists' view of the speed of evolution. . . . Increasingly . . . researchers are observing evolution in action. . . . Microbes and pests may change the fastest, but they are not unique."

—Rob Dunn, ecologist, North Carolina State University, in "Our Evolving Present," *Scientific American*, December 2007

Evolution in Action: Humans

"I was raised with the belief that modern humans showed up 40,000 to 50,000 years ago and haven't changed. The opposite seems to be the case. Our species is not static. . . . Rapid population growth has been coupled with vast changes in cultures and ecology, creating new opportunities for adaptation. The past 10,000 years have seen rapid skeletal and dental evolution in human populations, as well as the appearance of many new genetic responses to diet and disease."

—Anthropologist Henry Harpending, University of Utah, quoted in an Associated Press article by Randolph E. Schmid, and in a paper in *Proceedings of the National Academy of Sciences.*

No Evolution in Action: Space Aliens

"I bet not one person thinks the state of New Mexico puts a lot of solemn stock in space aliens, other than to say, 'Roswell has had a grand time with this space alien thing. So drop by and check it out, and while you're in New Mexico, you'll find a splendid place with splendid people, none of whom has undergone embarrassing medical probes by space aliens.'"

—Jim Belshaw, *Albuquerque Journal*, regarding controversy over New Mexico's float in the Tournament of Roses Parade featuring, in addition to the New Mexico Spaceport now under construction, Roswell-type "aliens."

Update News Notes

Here are updates from the news related to the topics of some recent articles in the SKEPTICAL INQUIRER:

The World Health Organization and UNICEF reported in October that improved routine immunization programs and huge national drives to give children a second dose of the inexpensive measles vaccine have contributed to a 91 percent reduction in measles mortality across Africa. Deaths plunged to 36,000 in 2006 from 396,000 in 2000. In that period, measles deaths fell 68 percent globally to 242,000.

* * *

A large federal study concluded that a mercury-based preservative once used in many vaccines does not raise the risk of neurological problems in children. The study results should assure parents about the safety of shots their kids received a decade or more ago. The study did not, however, examine autism, the developmental disorder that some people contend is related to vaccines. According to scientists at the Centers for Disease Control and Prevention who led the latest analysis and published the results in the *New England Journal of Medicine*, a separate study due out in a year will look at that issue.

* * *

The head of the Intergovernmental Panel on Climate Change and former U.S. vice president Al Gore accepted the Nobel Peace Prize at ceremonies in Oslo December 10. The prize was awarded to them jointly for their efforts on behalf of climate change. IPCC chairman Rajendra Pachauri spoke about the scientific evidence for climate change and its likely effects on world stability and vulnerable populations. Gore spoke of the need for action: "We, the human species, are confronting a planetary emergency—a threat to the survival of our civilization that is gathering ominous and destructive potential even as we gather here. But there is hopeful news as well: we have the ability to solve this crisis and avoid the worst—though not all—of its consequences, if we act boldly, decisively, and quickly."

* * *

A Democratic congressional report issued December 10 after a sixteen-month investigation concluded that the White House has systematically tried to manipulate climate change science and minimize the dangers of global warming. The report is based on hundreds of internal communications and documents as well as testimony at two congressional hearings revealing that scientists and government reports were edited to emphasize the uncertainties surrounding climate change. Republicans called the report a "partisan diatribe."

Tunguska Asteroid Size Downgraded by New Computer Simulations

Dubbed the Tunguska incident, an asteroid exploded over Siberia in 1908, flattening the trees in the forest for miles around.

The explosion that caused such incredible forest devastation at Tunguska a century ago in Siberia may have been caused by an asteroid only a fraction as large as previously published estimates, new supercomputer simulations suggest.

"The asteroid that caused the extensive damage was much smaller than we had thought," says Sandia National Laboratories principal investigator Mark Boslough of the impact that occurred June 30, 1908. "That such a small object can do this kind of destruction suggests that smaller asteroids are something to consider. Their smaller size indicates such collisions are not as improbable as we had believed." Because smaller asteroids approach Earth statistically more frequently than larger ones, he says, "We should be making more efforts at detecting the smaller ones than we have till now."

The new simulation—which more closely matches the widely known facts of destruction than earlier models—shows that the center of mass of an asteroid exploding above the ground is transported downward at speeds faster than sound. It takes the form of a high-temperature jet of expanding gas called a fireball. This causes stronger blast waves and thermal radiation pulses at the surface than would be predicted by an explosion limited to the height at which the blast was initiated.

Because of the additional energy transported toward the surface by the fireball, what scientists had thought to be an explosion between ten and twenty megatons was more likely only three to five megatons. The physical size of the asteroid, says Boslough, depends upon its speed and whether it is porous or nonporous, icy or waterless, and other material characteristics.

"Our understanding was oversimplified," says Boslough. "We no longer have to make the same simplifying assumptions, because present-day supercomputers allow us to do things with high resolution in 3-D. Everything gets clearer as you look at things with more refined tools."

The new interpretation also accounts for the fact that winds were amplified above ridgelines where trees tended to be blown down, and that the forest at the time of the explosion, according to foresters, was not healthy. Thus, previous scientific estimates had overstated the devastation caused by the asteroid, since topographic and ecologic factors contributing to the result had not been taken into account.

"There's actually less devastation than previously thought," says Boslough, "but it was caused by a far smaller asteroid. Unfortunately, it's not a complete wash in terms of the potential hazard, because there are more smaller asteroids than larger ones."

The new paper was co-authored with Sandia researcher Dave Crawford and presented at the American Geophysical Union meeting in San Francisco on Dec. 11.

Their simulations show that the increasing resistance of Earth's atmosphere compresses the material of an incoming asteroid. As it penetrates deeper, the more and more resistant atmospheric wall causes it to explode as an airburst that precipitates the downward flow of heated gas.

"If this revision is correct, the expected frequency of such impacts changes, from once in a couple of millennia to once in a few hundred years," commented NASA scientist David Morrison. "If smaller impactors can do the damage previously associated with larger ones, of course, the total hazard from such impacts is increased."

The Tunguska event has long been incorporated into some UFO lore. Some believers contend it was caused by the explosion of an extraterrestrial spaceship, but scientists consider that an unnecessary, nonscientific, fanciful, and unsupported idea.

Boslough and Crawford achieved acclaim more than a decade ago by accurately predicting that the fireball caused by the intersection of the fragmented comet Shoemaker-Levy 9 with Jupiter would be observable from Earth. □

INVESTIGATIVE

Entombed Alive!

It is a horrifying concept: being buried—or walled-up—alive. Fears of such possibilities were once rife.

In earlier times even physicians could not always determine infallibly whether an individual was dead or instead in a comatose or cataleptic state. Actual cases of people seemingly returning to life may have inspired ancient folktales about persons being raised from the dead.

Moreover, in Europe, untimely inhumation helped spread fears of vampires—those who returned from the dead to prey on the living (Bunson 1993, 211). Edgar Allen Poe (1809–1849) expressed, with his usual genius, the grotesque horror of living interment with his tale, "The Premature Burial."

Then there were incidents—real or imagined—in which for some motive such as punishment or revenge a person was deliberately entombed alive, the theme of another Poe story, "The Cask of Amontillado."

One such alleged occurrence was in St. Augustine, Florida, at the Spanish-built fortress, Castillo de San Marcos. Purportedly, an eighteenth-century colonel discovered his wife was having an affair and chained her and her lover to a wall in the dungeon; he "mortared a new wall of coquina stone in front of them" (Hauck 1996, 125). In fact, however, investigation shows that the event is historically unrecorded, and the tale is traceable only to the rumors and outright concoctions of tour guides in the early twentieth century (Nickell 2005, 26).

In my travels, I have encountered other living-burial stories. Here are three that I have investigated, two being of the deliberate-entombment type, namely a walled-up nun in the Netherlands and a castle's mystery room in Switzerland, and the third belonging to the premature-burial genre, featuring a vault with a view in a Vermont graveyard.

Walled-up Nun

During a lecture and investigation trip to the Netherlands and Belgium in 2006 (Nickell 2007), I was escorted by Dutch skeptic Jan Willem Nienhuys to Singraven, an estate near the small town of Denekamp in northeastern Netherlands. Built on old foundations in the first quarter of the fifteenth century, the estate's manor house or "castle" is said to be haunted.

Its secluded location helped give it an air of mystery and, as is the case with many historic sites, the ambience helped spawn ghostlore. After one lord of the manor began a cemetery on the grounds, superstitious folk began to say he invited bad luck. When his beard caught fire from an oil lamp, burning him severely, and when his wife died in childbirth, people would say, "The ghost of Singraven has struck again" (Wynia et al. 2006).

A young Dutch "psychic," Robbert van den Broeke, has visited Singraven and claimed to perceive numerous ghostly presences. Robbert—who busies himself giving dubious readings, producing questionable otherworldly photos, conveniently discovering crop circles near his and his parents' home, and so on (Broeke 2005)—did not, however, perform at his psychic best. He incorrectly identified an oil portrait as that of the noble with the burned beard (probably because he had seen a television show that made the same misidentification). He also placed the incident in the wrong room (Wynia et al. 2006).

In the mansion's drawing room, Robbert "saw" various ghosts sitting in chairs or moving about. However, tour guides at Singraven pointed out that there had never been reports of ghosts in that particular chamber, which, in fact, had been added relatively recently (Wynia et al. 2006). At Singraven and elsewhere, Robbert has produced "ghost" photos, but these seem on a par with his "alien" ones (see Nanninga 2005, 28), which are indistinguishable from ridiculous fakes.

The main target of Robbert's psychic and photographic efforts at Singraven is the colorful, spooky legend of a walled-up nun. A cloister occupied the estate from 1505 to 1515. According to a popular tale, one night a young nun slipped away

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for a clandestine liaison with her lover. Returning late, she attempted to sneak up the stairs, but they creaked and awakened the Mother Superior who decided to make an example of her. The unfortunate nun was sealed up in the wall near the foot of the stairway. As she slowly starved to death, her shouts of despair served as a warning to the other sisters (Wynia et al. 2006).

Now, this tale is implausible on the face of it—not only because it has an ostensibly devout prioress capriciously violating one of the Ten Commandments but because the cloister at Singraven was not for nuns at all but for Beguines (lay sisters). It is, in fact, a proliferating and often-debunked folktale. It has found its way into literature, for example in the epic poem *Marmion* by Sir Walter Scott (1808). Catholic scholar Herbert Thurston said of the legend (qtd. in Catholic 2006):

> To anyone who honestly looks into the matter, it will be clear that no statutes of any religious order have yet been brought forward which prescribe such punishment; that no contemporary records speak of its infliction; that no attempt is made to give details of persons or time; that the few traditions that speak of discovery of walled-up remains crumble away the moment they are examined; that the growth of the tradition itself can be abundantly accounted for; that the few historians or antiquaries of repute, whether Catholic or Protestant, either avowedly disbelieve the calumny, or studiously refrain from repeating it.

Thurston's skepticism is fully justified by the facts of our investigation at Singraven. The wall in which the nun was allegedly sealed—now graced with a mirror (see figure 1)—was actually opened up in the early 1990s. This was done by workmen who were replacing the manor's electric wiring. The workers discovered no bones inside the wall, thus discrediting the local legend and with it the ghost sightings of the nun at the alleged site of her horrible death (Wynia et al. 2006).

Such legends of nuns being walled-up for punishment may be derived from the fact that ascetics were sometimes voluntarily enclosed, hermit-like, for solitary meditation. We learned of a church in Utrecht with just such a history. Visiting there the day following our investigation at Singraven, Jan Willem Nienhuys and I found an incised stone tablet in the walkway at the side of the edifice. It reads (in translation): "Sister Bertken Lived Here as Hermit Walled in a Niche in the Wall in the Choir of the Buurkerk 1457–1514."

Figure 1. In a "haunted" manor house, Dutch paranormal investigator Jan Willem Nienhuys investigates the wall (behind the mirror) inside which an errant nun was reputedly sealed alive in the early sixteenth century. (Photo by Joe Nickell)

Called "anchoresses," the walled-up penitents were not nuns (they did not take vows, for example), and while they led very austere lives, their "cells" could be quite roomy and often had a door that led into the church. Such hermits even kept in touch with both common folk and nobles, dispensing spiritual counsel and practical advice. When, after the Council of Trent (1545–1563) the Roman Catholic Church became increasingly male-dominated, the urban anchoresses disappeared. (See Mulder-Bakker 2005.)

Mysterious Castle Room

Another entombed-alive legend is attributed to a curious little structure high atop a medieval castle in Switzerland. Overlooking the village of Oensingen, near Solothurn, Bechburg Castle could have been built as early as the mid-thirteenth century, although the earliest document relating to it dates from 1313 (Schloss 2007).

The enigmatic structure is at the highest part of the castle, except for an adjacent tower that continues upward (see figure 2). Roofed but doorless and windowless, the structure is the subject of a legend of uncertain vintage.

Reportedly entombed there was a certain Kuoni, a despicable robber-knight who terrorized the populace and shed much innocent blood. Finally, though, he received a kind of justice when he became afflicted with leprosy or some other contagious disease. According to the tale, he was walled inside the chamber, and servants fed him food and water through a small opening. When he died, this was closed with a stone. Supposedly, however, the chamber could not contain the restless soul of the evil man, which still haunts the castle on certain nights (Roth and Mauer 2006).

The fanciful tale of a leprous knight being walled-in sounds less like historical fact (especially since the spot seems an unlikely place for such confinement) than folkloric fiction inspired by accounts of walled-up ascetics.

Nevertheless, the name Kuoni—a diminutive of Konrad—has been common among the barons of the Bechburg, and there is an old document that could seem to support the legend. Dated 1408 and penned by Count Egon von Kyburg, it reports repair work occurred on the "alcove" (or "little chamber") in which "Kuoni reposes" (Roth and Maurer 2006). Ghost proponents assume that

this refers to the mysterious structure and so confirms that someone named Kuoni is entombed there. But might it not also refer to another place on the premises where, say, a child—little Konrad—slept?

In any case, there is no apparent evidence that the small roofed structure ever had a door or windows. Moreover, when I visited the castle with German skeptic Martin Mahner on May 25, 2007, we discovered something that none of our sources mentioned: its shape is peculiar. While one side meets the front at right angles, the other curves smoothly into it (again, see figure 2). This suggests that, architecturally, its purpose may have been partially or even totally stylistic.

As we learned from files at the city hall in Oensingen (Schloss 2007), a further possibility was suggested by a provincial historical-building supervisor. He had a worker use a jackhammer to drill into the mysterious structure from the top. While this was in progress, a severe lightning and hail storm arose and ended the exploration, but not before a depth of one meter had been reached. This led the supervisor to conclude that the little prominence has incredibly thick walls, indeed that it is probably not hollow at all but instead just a defensive bulwark.

Figure 2. At the eastern end of Switzerland's Bechburg Castle is a roofed little room (upper left) in which an evil knight allegedly was sealed after contracting leprosy. (Photo by Joe Nickell)

Of course, even if the entire Kuoni folktale is untrue, that does not disprove the claims that the place is haunted. But what is the evidence that it is? Well, a tour guide who "usually" leaves the tower door open sometimes returns to find it closed again. Since it is latched from the inside, this cannot happen accidentally, and he dismisses suggestions that it could be a prank by visitors. He continually feels that he is not alone, and he sometimes hears voices along an empty hallway, but he is unsure whether they belong to ghosts or whether it is simply the wind carrying the voices of people who are walking nearby. Once, years ago, a volunteer worker during spring cleaning heard footsteps behind him as he descended the tower stairs. When he looked there was no one behind him, yet as he continued on so did the sounds. He insisted they were not the echoes of his own footsteps (Roth and Maurer 2006, 105–108).

Such anecdotal evidence, however spine-tingling it may be to some, has no weight in the scientific investigation of paranormal claims. If spooky happenings at Bechburg Castle are not due to the suggested causes already given—a prankster latching a door, the wind carrying voices, or the echo of one's own footsteps—clearly there are other possible explanations (cf. Nickell 1995, 39–77; 2001). We must ask: how, without a brain, can a disembodied spirit think, walk, or say boo? Science has never attributed a single occurrence to the alleged supernatural realm.

Vault with a View

A large, grassy mound seems strangely out of place near the front of Evergreen Cemetery in New Haven, Vermont. At the top of the mound is a small glass window encased in a square of cement that invites passersby to peer into the grave below (figure 3). The window was placed there at the behest of its tenant, and therein lies a spooky tale.

The deceased was Dr. Timothy Clark Smith (1821–1893). Between stints as a schoolteacher, merchant, and Treasury Department clerk, he studied medicine at New Haven (1834–1844) and the University of New York (1853–1855), obtaining his MD degree in 1855. He subsequently became a staff surgeon in the Russian army (1855–1856). Afterward, he served as U.S. Consul, first at Odessa, Russia (1861–1875), and then at Galatz (1878–1883) (Robinson 1950, 117). One source states that Smith's travels earned him the sobriquet "Odessa" Smith (Marquard 1982).

Smith died on February 25, 1893, at Middlebury, Vermont. I found his obituary in a later (March 3) *Middlebury Register*. It reported that he "died suddenly on Saturday morning at the Logan House [hotel] where he had been living. After breakfast, he walked out into the office and stood by the stove when stricken. . . ." A local-news article in the same issue noted that he was "formerly a resident of this town," adding that "Many will remember the old red store where Timothy Smith, Sr., traded, and afterwards his son." The article also noted that "The deceased leaves a wife and several children."

A modern newspaper feature story on the grave (Marquard 1982) says of Smith's era:

> It was the late 1800s—in times before embalming—and folks didn't have to travel far to hear tales of people who had been presumed dead, only to be buried alive.
>
> One legend has it that Smith particularly feared contracting sleeping sickness, and waking up on the cold side of a coffin cover.

Smith therefore devised a plan that

Figure 3. Atop this Vermont cemetery mound is a concrete-encased window to the grave below. The man interred reportedly feared "premature burial." The stone in the foreground seals the stairway to the arched vault. (Photo by Joe Nickell)

involved postponing his burial until he was assuredly dead and having his arched burial vault provided with stairs and a viewing window at the top of a glassed shaft.

One of Smith's children, Harrison T.C. Smith of Gilman, Iowa, reportedly traveled to New Haven "to supervise construction of the unusual crypt" (Marquard 1982). The vault has two rooms, cemetery sexton Betty Bell told me (2003), the second being for Smith's wife, Catherine (Prout) Smith.

According to the feature article, there are other legends about the tomb. One is that Smith had it outfitted with "tools for his escape." Although condensation and plant growth inside the shaft now block one's view, residents in years past claimed to see the tools along with Smith's bones. Said one, "You can see the face of the skeleton down there with a hammer and chisel crossed on the ground next to it" (Marquard 1982). Another source claims that when Smith was interred, "In the corpse's hand they placed a bell that he could ring should he wake up and find himself the victim of a premature burial" (Citro and Foulds, 2003, 292).

Curiously perhaps, ghost tales about the grave seem scarce. The authors of *Curious New England* (Citro and Foulds 2003, 292) attempt to provoke the credulous. Mentioning the bell allegedly placed in Smith's hand, they say, "So if you decide to visit the cemetery, keep very quiet . . . and listen." I did but, not surprisingly, heard nothing.

Area resident John Palmer (2003) told me that for fun he used to send impressionable children to the site to scare them. He still felt guilty about one such event. He had his two older boys take a couple of six-year-olds to the grave, telling them a person was alive down there. Then suddenly they exclaimed, "The ground is moving!" whereupon Palmer—who had hidden in the trees—jumped out screaming. The two youngsters were so scared that they ran into each other's arms and fell down.

Actually, Palmer told me, although as a child he had himself played there with other children, he never saw any ghosts or even heard any ghost tales. I guess Timothy Clark Smith is dead after all.

Acknowledgments

In addition to Jan Willem Nienhuys, Martin Mahner, and others mentioned in the text, I am grateful to Timothy Binga, Director of CFI Libraries, and Suzanne Douglas, librarian at the Henry Sheldon Museum in Middlebury, Vermont, for research assistance, as well as Paul Loynes for typing this manuscript.

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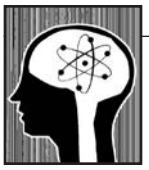

Toward a Consilience of Sciences and Humanities?

In 1998, biologist Edward O. Wilson published a controversial book titled *Consilience: The Unity of Knowledge*, in which he made the bold suggestion that all human knowledge will eventually be encompassed by the sciences, with the humanities, social sciences, arts, and religion subsumed by the scientific worldview, in particular by biology. Almost a decade later, the debate is still raging, with science on the offense and pretty much everyone else on the defense. Indeed, it is precisely the sort of scientistic attitude displayed by Wilson and some of his colleagues before him that has arguably been at least in part responsible for the popularity of the equally irrational postmodernist movement that seeks to depict science as just another cultural tradition on par with astrology, creationism, and religion.

That the sciences and the humanities have had a difficult relationship is no secret, and it has been made overtly clear ever since C.P. Snow's classic 1959 essay "The Two Cultures and the Scientific Revolution." Snow, however, advocated a renewed dialogue between the two with the aim of unifying human knowledge in the sense of amplifying its scope through a continuous reciprocal feedback between the two sides of the divide. Wilson and the postmodernists on the other hand wish to vanquish their opponent by respectively absorbing the humanities into their own field or denying its special place in the human intellectual landscape.

The word *consilience* was ironically enough coined by a philosopher, William Whewell, in an essay entitled "The Philosophy of the Inductive Sciences, Founded upon Their History." Even more ironically, Whewell's ideas were more than a bit worrisome to Darwin, whose work on evolution was considered by some as sub-par science precisely because it did not conform to Whewell's view of inductive inference (Darwin argued that his writings were, on the contrary, a prime example of such a method, and he was right; see *Thinking About Science*, SI March/April 2004).

Consilience means inference to the best induction, a mental process by which one reaches a conclusion not because it is the only possible one or because it necessarily follows from formal deductive reasoning (as in the proof of a mathematical theorem), but because the available information "points" to a particular answer as by far the most likely of the available alternatives. This may seem a rather weak way of gaining knowledge, but it turns out that—as Whewell persuasively argued—science is in fact largely based on the use of consilience.

But Wilson misuses the word despite his awareness of Whewell's work. For Wilson, consilience means that all human knowledge will eventually be unified into one broad vision, and that vision will be provided not by a dialogue between the sciences and humanities but rather by the absorption and reduction of the latter by the former. Talk about a theory of everything! Religion, for instance, is for Wilson a mere biological phenomenon understandable in terms of sociobiology (the other highly controversial idea he launched back in 1975 with his *Sociobiology: the New Synthesis*). Morality will turn out to be the culturally codified version of behaviors predicted by game theoretical models and biological phenomena like kin selection and reciprocal altruism. The arts, too, will eventually be understood in terms of the innate human appreciation for symmetry and the pleasure of uncovering complex patterns, itself the result of natural selection in our ancestral environments.

I don't doubt that there is more than a grain of truth to what Wilson says. There is little question in my mind that everything we human beings do is in part rooted in our biology and therefore in our evolutionary history. How could it be otherwise? The reason I have a hard time resisting a chocolate cake or a double cheeseburger is because I share with other people an ancient instinct to stock up on any source of energy that may not be available for weeks or months to come

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(there were, alas, no McDonald's in the Pleistocene). But to pretend that our biological roots can by themselves satisfactorily explain the complexity and nuances of modern fine dining is either extremely naïve or an intellectual joke.

Take morality as perhaps the most relevant example. Indeed, game theorists, neurobiologists, and primatologists are uncovering a wealth of relevant information about where our sense of morality comes from and how it works (see Frans de Waal's *Primates and Philosophers* for a recent stimulating discussion). Without these insights, a fundamental component of human behavior would be puzzling to say the least, not to mention that it would inevitably stink of mysticism. But again, it is one thing to understand the biological roots of a phenomenon or even its current neurobiological substrate and an altogether different thing to claim that biology can give us a satisfactory account of the panoply of current and historical ethical norms across societies.

Knowledge (as in Wilson's phrase of "The Unity of") has been conceived ever since Plato as justified true belief. That is, we can claim to know something if (a) we believe something to be true, (b) it is in fact true, *and* (c) our belief is justifiable according to reason and evidence (one could be holding onto a true belief by sheer luck or without being able to explain it, in which case one cannot claim to have knowledge). Certainly this definition of knowledge explains very well what scientists aim for. It becomes a bit more problematic, however, in the case of, say, morality, where there is ample room for discussion about whether the very idea of true or false moral beliefs makes any sense. The concept of knowledge in the Platonic sense certainly doesn't apply at all in the case of the arts. Nobody, not even Wilson, can seriously claim that my dislike of much abstract art and love of surrealism is founded on knowledge in the Platonic sense. It is a matter of taste, not a question of truth. It is a value judgment, not a finding of facts. That my taste may be remotely informed by aspects of my biology is a truism, since I am in fact a biological being. But to conflate this with the ability of science to deliver justified true belief about the world is a slight to art and a disservice to science. □

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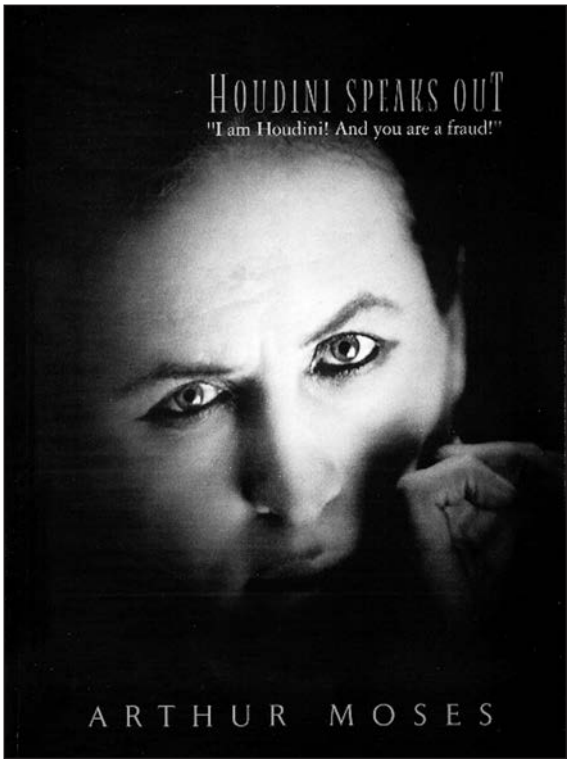
'I Am Houdini! And You Are a Fraud!'



Though it seems that everything has already been said and written about magician Harry Houdini, every now and then something "new" emerges that helps historians and fans alike illuminate some dark corner of his amazing personality.

This time we have one of Houdini's most avid collectors, Arthur Moses, to thank. Moses, who lives in Forth Worth, Texas, owns one of the world's largest collections of Houdiniana: over 1,500 books in eleven languages (plus Braille), 1,200 magazines, countless photos, autographs, posters, handcuffs, pamphlets, and some unusual personal belongings. These include one of the straitjackets used by Houdini for his escapes, a crate that he used for packing when he toured overseas, and the monogrammed pocket from the pajamas he was wearing when he died (one wonders who had the idea of cutting the pocket off). But it's likely that Moses's most prized item is a set of lantern slides that Houdini used for his lectures on spiritualism. Lantern slides were precursors to 35mm film slides, ancient predecessors of PowerPoint presentations.

Moses was also able to locate Houdini's written commentary that accompanied the slides and an old syllabus of his talk. He combined all of this material in an illustrated book that he just published, *Houdini Speaks Out*, which gives us the closest thing to witnessing a live Houdini lecture (for more about the book see www.houdinispeaksout.com).

Houdini, the Lecturer

During his later shows, Houdini presented discussions about spiritualism—and the trickery connected to it—along with his magic and escapes. Since this often turned out to be the liveliest part of the show, in February 1924 he signed a contract with the Coit-Alber lecture bureau to undertake a full lecture tour on spiritualism all over the midwestern and southern United States. He had occasionally talked about the subject for college classes; this time, however, it was a real tour composed of twenty-four lectures in twenty-four cities.

"I am fifty years of age today," he wrote in his diary on his birthday. "I can't believe it. But I am!! But not in body and far from it in mind. I believe if I live I'll be better, body and mind, than ever before, and more capable of making a living in my old age. But I must provide now!"

At his age and in his position, Houdini could very well have retired, as he had often claimed he would, and devote himself only to writing. Instead, even though he was one of the highest paid performers of his time and could command any fee he wished, he elected to tour the country in a series of one-night stands as a lecturer, at a lecturer's wage.

Two things most likely led him to this decision. First, he honestly disliked unscrupulous mediums who took advantage of a gullible public. Perhaps

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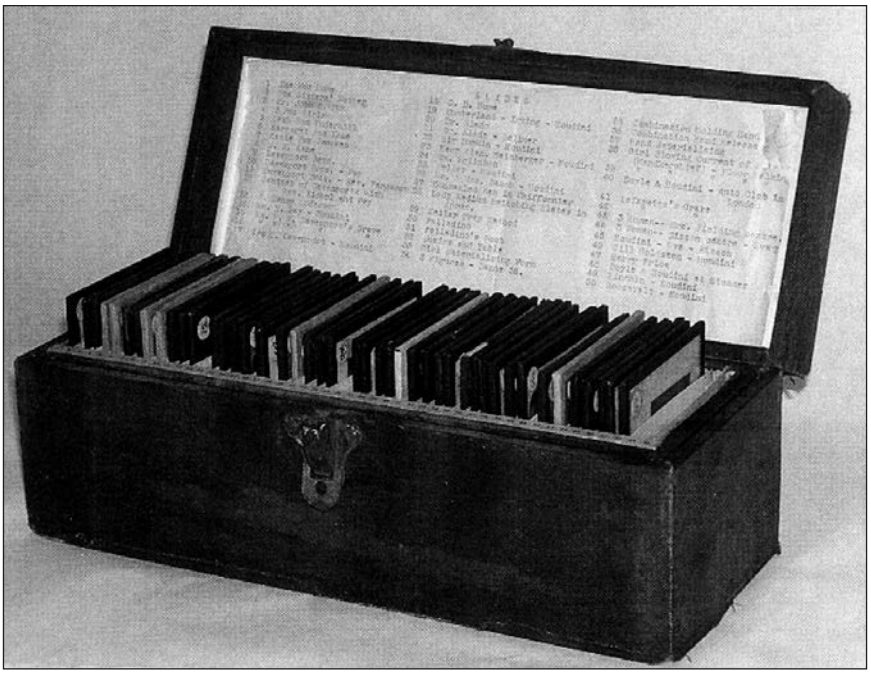

This box of Houdini slides is owned by Arthur Moses.

Moses, who lives in Forth Worth, Texas, owns one of the world's largest collections of Houdiniana: over 1,500 books in eleven languages (plus Braille), 1,200 magazines, countless photos, autographs, posters, handcuffs, pamphlets, and some unusual personal belongings.

more important, though, he certainly enjoyed his change in status. *Billboard* stated it best: "Houdini the magician has become Houdini, the educator!"

This new position not only allowed him to mingle with the literati (or to "meet the intelligents [*sic*]" as he wrote in his diary), something that he really enjoyed, but he was now also in the same circles as Sir Arthur Conan Doyle, creator of the Sherlock Holmes stories and fervent supporter of spiritualism. Houdini and Doyle had been friends but later practically became enemies because their radically opposed views of spiritualism made it impossible for them to continue their friendship.

"Wait till Sir A. C. Doyle hears of my lectures!" he wrote gleefully in his diary.

Houdini Speaks Out

Houdini had about fifty slides made with portraits of famous mediums like the Fox Sisters, the Davenports, D.D. Home, Harry Slade, Eusapia Palladino, and others; magicians like Harry Kellar and Will Goldston and, of course, of Houdini himself in the company of some of these characters or standing beside the graves of those he could not meet (graves he frequently had repaired and cleaned up at his own expense). In a couple of shots, he is standing with Conan Doyle before their relations soured. There are also a number of slides detailing how to produce fraudulent spirit phenomena, including the production of spirit messages on slates, the materialization of spirit forms and spirit breezes, and the production of spirit photographs.

One of the most fascinating images reproduced in Moses's book is "Eusapia's Sapient Foot"—medium Eusapia Palladino's method of freeing one of her feet during a séance and using it to produce movements and noises in the cabinet behind her. Even though I have discussed this particular stunt in great detail (Polidoro and Rinaldi, 1998), this was the first time I had seen the artifice reproduced visually (I don't think that what we see is Eusapia's actual feet!).

During his lectures, Houdini had a very easy-going, friendly manner that immediately conquered the audience. Usually after an introduction in which he would discuss his past experiences in spiritualism, the slides were shown. Here is an example of how Houdini opened a typical lecture on Spiritualism:

> About thirty years ago in Garnett, Kansas, I was traveling with . . . a philanthropist, [with a] long beard and long hair, and he stood on the street corner and told the people that he would sell them a bottle of medicine worth a hundred dollars for a dollar. And I was the man that sold it for him. Then Wednesday morning at the hotel he said, "Houdini, things are a little quiet in the show business. Can't you do something on a Sunday night of a religious nature so we can get a house?" I said, "There is one thing I can do of a religious nature and that is make a collection" [Laughter].
>
> He said, "You will have to make one for me if business doesn't hurry up. . . . Why don't you do a couple or more tricks and I will advertise it as a spiritualistic séance." I says, "All right, go ahead." He says, "I have got to square the chief of police." That was very easy, thirty years ago, to square the chief of police even in Garnett, Kansas. And he was a very fine chap, really, he was very fine [Laughter]. That Saturday—they had a weekly paper there—that Saturday the paper had great big headlines. "Houdini the World Famous Medium, who only gives séances in [the] largest cities in the world"—and I had just come from Appleton, Wisconsin, [laughter]—"has

been prevailed upon by popular request of the public"—that was Dr. Hill—"to give a séance. Pianos will float over the heads of the audience, tables will be levitated by unseen hands, messages will appear." . . . I was good in the newspaper. I still have it in my scrapbook.

Well that Sunday night, ladies and gentlemen, I gave what I believe was the most sensational spiritualistic performance that ever took place in Garnett, Kansas. And I tell you why I was qualified to give that marvelous entertainment. That Sunday morning, accompanied by the sexton and the oldest inhabitant of the town, we walked out to the village cemetery, and I had a notebook, and what was not carved on the slabs of marble or granite tombstones—any information that was lacking—the sexton would tell me the missing data, and the old Uncle Rufus would give me the scandals of everyone sleeping in God's acre [Laughter]. And can you imagine going out there . . . and retailing that terrible stuff. Their eyes stuck out. I know one man named Obermeyer—I had brought back his grandfather, and I said "Obermeyer, you are not doing right by the grandson." He got up and said, "Tell my grandfather I will take care of him in the morning" [Laughter]. (Silverman 1996)

Every now and then, to better exemplify a few points, Houdini would perform some of the tricks he described. It was not enough to say that the medium Henry Slade used tricks to make "spirit messages" appear on his slates; to be more convincing, it had to be shown *how* he did it. Among other things, Houdini would sit at a table and show how to ring a bell with his toes while giving the impression to the person sitting in front of him that both his hands and feet were at rest.

Houdini's lectures were a huge success, so much so that the tour was extended two months. In addition to his lectures, Houdini was frequently called to address religious groups, radio stations, public debates, and parties, and journalists would frequently call on him for his opinion on psychic matters. Thanks mainly to his lectures, Houdini came to be seen more and more as a real authority on the psychic world, an expert that could really help people not to be taken in by frauds. Reading Arthur Moses's book helps the reader to better understand why.

Growing up with Houdini

One of Houdini's original slides, showing Houdini and the "spirit" of Lincoln (actually, a double exposure).

Moses is rightfully proud of his collection, as is his family. His daughter Wendy recently wrote about "growing up with Houdini" in an article in NewsOK.com (Kleinman 2007): "In my family's previous house, a seven-foot restored poster of Houdini's face sat in our dining room. The painting style is one where the object's eyes seem to follow people around the room. In short, when we entertained family and friends in the formal room, you had a strange sense you were being watched."

Over the years, Wendy and her family have had their share of unusual experiences. David Copperfield spent two hours at their house after a show in town; thanks to Houdini they all spent a vacation in England, where Moses had been invited to lecture; they have been awakened by news crews at six A.M.; and the children have used Houdini items for show-and-tell in school. Wendy was also levitated three feet off the ground by magician Walter "Zaney" Blaney at a family function and served as an "unpaid security guard" to protect the collection while her father guided tours of Boy Scouts or magicians: "My mom, Linda, and my brother, Brian, and I had to make sure no one tried to pull a disappearing act with any of the items."

The book her father wrote was also somewhat of a family affair. "My mom scanned and prepared all the images printed in the book," says Wendy. "I read and edited it—twice; and my brother made it into the dedication for inspiring my dad."

Now, Wendy has a better understanding of her dad's strange obsession: "I remember growing up wondering why I had to have the dad with the weird hobby. At some point, I became indifferent to its magnitude. And now I have an appreciation for the work and passion my dad has put into his collection."

For his own part, Arthur Moses feels privileged to own original Houdini memorabilia, but explains he is only a temporary caretaker: "Someone has owned these before me, and someone will own them after me."

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Alien Ghosts at Roswell

Can a pseudoscientific documentary be so insulting to the viewer's intelligence that even the cable channel planning to run it turns it down? Apparently at least one was: "The Alien Ghosts at Roswell," produced by Jim Marrs, a well-known author and conspiracy theorist. Marrs first made his reputation on JFK assassination conspiracy claims, then moved on to "the extraterrestrial presence," psychic spies, secret societies, and September 11 conspiracies. The documentary was made for the Discovery Channel, which has not shied away from many other programs making absurd claims about hauntings, life after death, numerology, etc.

For several years, Marrs has been promoting the story that not only did a saucer crash near Roswell in 1947, but some of the alien beings killed in the crash left behind ghosts. The former Army Air Base hospital, now the New Mexico Rehabilitation Center, supposedly contains one wing where "none of the personnel want to work." Reportedly this is "because of strange and unexplained incidents which have occurred there." Lights have supposedly turned themselves off and on, the elevator doors have unaccountably opened and closed, and areas of intense cold are felt. Some say a strange figure appears in the upstairs hallway. "It all seems to take place on the second floor near the room where they supposedly did an autopsy on the aliens," said systems analyst David Owen. "I've heard people say they have seen aliens running around" (see http://www.jimmarrs.com/news/012204.html).

Robert Sheaffer's World Wide Web page for UFOs and other skeptical subjects is at www.debunker.com.

To exploit his remarkable "scoop," Marrs produced a forty-five-minute documentary titled "The Alien Ghosts at Roswell." However, after the folks at the Discovery Channel saw the video, they didn't want it. Fortunately, UFOlogist James Moseley was able to get a copy, which he reviewed in his publication Saucer Smear (October 20, 2007). According to Moseley, the video was filmed at the old Roswell air base and "stars a group of psychic researchers led by UFOlogist Nick Redfern." One scene shows an animated alien walking down the hallway to illustrate what has supposedly been seen.

Moseley writes, "We are told that [the Discovery Channel] paid off Jim Marrs's entire contract and went on to other things. Thus it will probably never be seen by the public, alas." I'm not so sure about that. Can there be no TV channel so desperate for sensational material that it will accept this? Even if we don't see it on TV, I suspect that Marrs's "Alien Ghosts at Roswell" will be shown at UFO conferences before long and probably be sold on DVD.

But even if the alien-ghost aspect of the Roswell story should fade away, new and exciting yarns continue to flow from this seemingly inexhaustible fount. Conspiracy author Jerry E. Smith has announced that he is working on a book titled *Roswell: The Nazi Connection* (see http://www.jerryesmith.com/index.php/137). In this book, scheduled for publication in early 2009, Smith will suggest that the saucer that allegedly crashed near Roswell in 1947 was in fact a Nazi secret weapon piloted by uniformed officers who were not yet ready to give up in their fight for the Fatherland.

* * *

Most people are totally unaware of what would surely be the most shocking event in U.S. military history if it had actually occurred: the Flying Saucer Air Wars of 1952. At last, this long-neglected history is finally revealed to the world in *Shoot them Down: The Flying Saucer Air Wars of 1952* by Frank C. Feschino, Jr.

The book, which boasts of a foreword (and an epilogue) by the "flying saucer physicist" Stanton T. Friedman, explains how the Air Wars were somehow connected to the famous Flatwoods Monster of September 12, 1952, in which a twelve-foot-tall, glowing, hooded creature was reportedly seen floating through the woods of rural Braxton County, West Virginia. (Feschino explains that the creature's "hood" was just a misperception; it was actually wearing a space helmet.) Feschino claimed in a recent Internet podcast (see http://tinyurl.com/2x89bv) that there were 18.5 hours of UFO sightings that same day from many different locations. Thirty objects were, he claimed, seen coming in over the Eastern Seaboard and appeared to be following a damaged craft. Feschino claims that 180 military troops were sent to Braxton county to deal with all of the UFO crashes, and that a dead alien was found near Wheeling, West Virginia, that same night. The Flatwoods Monster, says Feschino, crawled out of one of those crashes and was dripping something like oil. Many pieces of metal were recovered from the crashes around Flatwoods; unfortunately, none of those pieces can now be located.

UFO crashes occurred that night not only in West Virginia, but in eleven states. However, Air Force F-94 Starfighter jets also went down near the UFOs. Stanton

Friedman, in the same podcast, asserted that there has been a "hidden war" going on, resulting in plane crashes. As Friedman explained on the popular *Coast to Coast* AM radio show the night of December 7, in the 1950s, the U.S. military had standing orders to shoot down unidentified craft if the craft didn't land when instructed—"and it appears that UFOs shot back." He added that there is no question that our planes were the aggressors. Friedman suggests that because of these losses, the U.S. military eventually gave up their UFO-shoot-down policy and instead began simply observing them with their instruments. So it would appear that the saucers' pilots, not ours, are in fact the Top Guns on this planet.

* * *

More amazing space discoveries: a man named John Lenard Walson claims to have extended the capabilities of small telescopes in ways that somehow have not occurred to optical engineers who have spent years working to do exactly that. What he claims to have found using them is truly unbelievable: "big machines" of unknown origin parked in Earth's orbit. According to the conspiracy-oriented radio talk show host Jeff Rense:

> What you are about to see is quite remarkable. It seems that some of the stars above us are not stars at all . . . as you shall see. A young man by the name of John Lenard Walson has discovered a new way to extend the capabilities of small telescopes and has been able to achieve optical resolutions—at almost the diffraction limit—not commonly achievable. With this new-found ability, he has proceeded to videotape, night and day, many strange and heretofore unseen objects in earth['s] orbit. The resulting astrophotographic video footage has revealed a raft of machines, hardware, satellites, spacecraft and possibly space ships which otherwise appear as 'stars' . . . if they appear at all. (see http://www.rense.com/general79/wdx1.htm)

What Rense doesn't seem to realize is that all of the visible stars have been quite fully mapped out, and when a "new star" or nova appears, it is very quickly spotted and studied. (UFOlogists frequently make the claim that UFOs sometimes "hide" among the stars undetected, revealing how little they understand astronomy.) Of course, any object in Earth's orbit would appear to be a moving star, not a stationary one, and any unexpected or unknown satellite would likewise be quickly detected by NORAD and also by dedicated amateur satellite observers. Walson's "evidence" consists of blurry photos of what might be spacecraft—or practically anything else. Even more amazing, Walson is picking up sounds from these unusual spacecraft

as well: "In addition to discovering and refining his optical telescope videotaping technique, John has also discovered how to actually hear and record the sounds in real time coming from the particular craft he is videotaping. By carefully aligning a satellite dish receiver with his telescope, he has been able to record some very unusual and intriguing sound from the different spacecraft." As final proof that what he says is true, Walson claims harassment by military helicopters, and to substantiate that claim he submits photos of helicopters!

But if UFOlogist Linda Moulton Howe is correct, these huge, honking, orbiting machines may be just the tip of the iceberg. Howe has written extensively about a "Secret American Military Space Program" (see http://tinyurl.com/yp47np). She interviews those who claim to have knowledge of a secret military program far advanced beyond the public one we know about run largely from secret underground military bases. The proof? Decades-old newspaper clippings describing ambitious space projects that never got off the ground. Aah, but they did, suggests Moulton Howe—and promptly went underground! This conspiracy apparently also involves the Masons, because one high-ranking NASA Apollo manager was a Mason of the 33rd degree, as well as esoteric ancient Egyptian wisdom, because an Egyptian geologist worked on lunar science for the Apollo program. (How can anyone dismiss solid evidence like that?)

* * *

Having little expertise in astrology, I found myself unable to judge the significance claimed of 2007's winter solstice alignment of Jupiter and Pluto with the galactic center (which happens to lie near the solstice point anyway). So I consulted the Web site of an expert: Shamanic astrologer AJ McGettigen, who is quoted by the above-mentioned *Coast to Coast* AM show (see http://tinyurl.com/3cpaoj). "Winter Solstice has arrived with an awesome once-in-a-lifetime alignment. This year the Sun has arrived at its southern solstice at the same time as Pluto is aligned with the Galactic Center and Jupiter. This event is rare because Jupiter only visits this part of the sky once in every twelve years. However, Pluto only appears in this area for a brief period every 250 years. The importance of this event is great—perhaps the most significant celestial alignment of our new century." Unfortunately, there don't seem to be any specific predictions resulting from this momentous event other than "As we behold Pluto aligning with the heart of our galaxy, our relationship to this great cosmic presence is renewed and regenerated." One overlooked problem, however, is Pluto's recent demotion from a small planet to a large asteroid. One would expect its astrological significance to be diminished as well.

What would be even more impressive than the above would be the discovery of a previously unknown planet based solely on observations of its astrological influences. The unseen Neptune was deduced by its gravitational effects before it was discovered; why can't astrologers do the same? □

Bark at the Moon

Q: My local newspaper runs a weekly column about planting flower and vegetable gardens by the phases of the moon and the signs of the zodiac. For the life of me, I can't understand how either could have any bearing on a seed planted in the ground. . . .

—S. Downey

A: Your question is a good one that addresses an issue all too rarely questioned when people hear unusual claims: "What is the mechanism?" Claimants and mystery-mongers are usually too busy promoting the end-result of the claims (e.g., "I can read people's minds!" or "This woman can detect water with a dowsing rod!") to address the fundamental question of how exactly these phenomena supposedly happen.

Astrologers in particular have repeatedly failed to explain how the exact position of planets and celestial bodies could have any possible effect on a newborn. Why would a planet here or there somehow decide which personality traits of the twelve sun signs a newborn would eventually exhibit?

The zodiac question is all the more dubious when applied to plants.

Jackie French, an avid gardener and author of several gardening books, had the same question and looked into this phenomenon. Upon first encountering the claim, she stated that "moon planting seemed like a load of codswollop." (French lives in Australia, where colorful phrases like "a load of codswollop"

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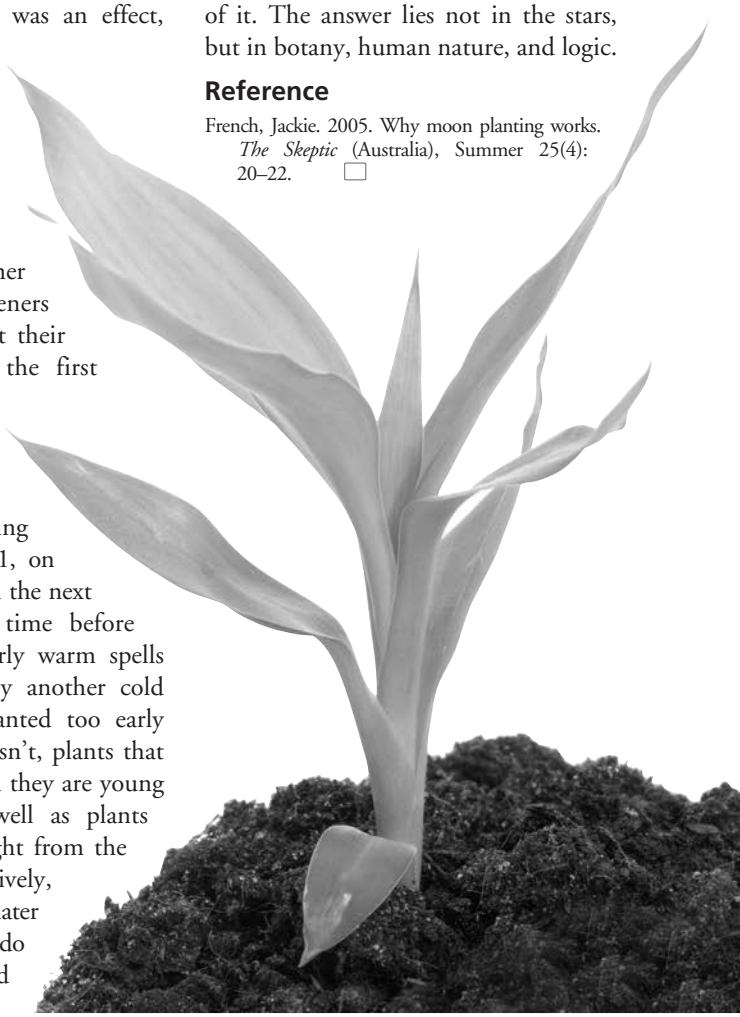
are much more common and effective than stateside.) French made some initial investigations using bean seeds, all of which showed no moon effect at all. That's where the matter stood for many years. Yet French kept hearing about the benefits of moon planting from longtime gardeners who seemed certain of the moon's effects. French decided, codswollop or no, to try again. The results were still negative, but one morning at daybreak it dawned on her (as luck and metaphor would have it), that perhaps there was an effect, but it had nothing to do with the moon's phases.

French described her analysis: "Let's look at a possible scenario. Gardener 1 is a moon planter; Gardener 2 is not. Both gardeners wait till spring to plant their beans. . . . But come the first warm spell, Gardener 2 succumbs to one of the great spring urges and plants the beans at the first hint that spring has arrived. Gardener 1, on the other hand, waits till the next good moon planting time before planting the seeds. Early warm spells are usually followed by another cold one . . . and seeds planted too early may rot. Even if it doesn't, plants that suffer any setback when they are young usually don't do as well as plants that have flourished right from the start. So, counter-intuitively, beans that are planted later in spring will probably do better than beans planted too early. The result: Gardener 1's moon-planted beans produce sturdier plants and crop earlier. . . . It's this tendency to slightly later spring planting and perhaps slightly earlier autumn planting, that I suspect is the reason so many gardeners will swear that they see an effect."

Sometimes when investigating the paranormal we find that the effect is real enough, but the causes are misattributed; this is an example of the common logical fallacy of *post hoc ergo propter hoc*, after this, therefore because of it. The answer lies not in the stars, but in botany, human nature, and logic.



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China Gone Modern

Amid explosive growth and modernization, China and CFI congress speakers ponder sustainability and the popularization, enjoyment, understanding, and widest possible applications of science.

KENDRICK FRAZIER

In the nearly twenty years since our last visit to China (see "CSICOP in China," SI Summer 1988), the country has undergone a stunning economic and physical transformation. The major cities are almost unrecognizable. The capital city of Beijing is a sprawling mass of modern, new high-rises. Construction cranes steadily raise ever more. In marked contrast to the dreary public lighting of the late 1980s, giant neon advertisements and flashy decorative lights on buildings and bridges brightly illuminate the nighttime streets. On the northern outskirts of the city, a vast area hums under twenty-four-hour construction to accommodate the 2008 Beijing Olympics. (Given the new China's obvious ability to carry out huge projects, I think Olympic

visitors are likely to be impressed.) Cars are everywhere (and not small ones either), fast replacing the ubiquitous bicycles of two decades ago. Five multilane "ring road" freeways circle the enormous metropolitan area.

To the south in Shanghai, China's economic capital with a population of around 17 million, the changes are breathtaking. An entirely new city, the Pudong area of Shanghai, has been constructed just east of the Huangpu River, marked by dozens of striking, imaginatively designed skyscrapers. One, nearing completion, is destined to be the third tallest in the world. All have been built since 1990. In this incredible period, three thousand new buildings of more than twenty stories have been erected. The three-sphered, three-legged Pearl Tower (468 meters, or 1,536 feet, high), beautifully illuminated at night, rivals the Eiffel Tower in iconic stature, and nearby skyscrapers likewise compete for the sky. An evening river cruise reveals the dramatic nighttime skyline. Some of the buildings sport twenty-story-high, swiftly changing, electric-lighted imagery.

And the planning and building goes on. Shanghai billboards tout the 2009 World Expo to be held there. The beautiful Shanghai Science and Technology Museum we visited is only five years old. The Shanghai Urban Planning and Exhibition Center boasts two huge, intricately detailed, three-dimensional scale models of the city. One is the core city as it is now. The other, the biggest in the world, extending over 600 square meters and covering most of an entire floor, envisions the city as it will be in 2020. The ports, the airport, the river facilities, and the subway system all are being expanded.

We took an evening ride to the international airport on Shanghai's new Maglev (magnetic levitation) train, covering 30 kilometers in an effortless eight minutes. In contrast, our harrowing, lane-shifting, racecar-like morning taxi ride through heavy traffic back to the airport took an hour and threatened to cost us our lives.

In Beijing, the very nice China Science and Technology Museum, which we also visited, is only thirteen years old and is already being replaced by a huge, new one, which is under construction at the site of the 2008 Olympics. CFI members enjoyed a special tour. The museum's deputy director proudly told us that as the biggest science museum in the world, it will encompass a total construction area of 180,000 square meters.

The energy and dynamism are palpable. Street markets remain, but on major thoroughfares every upscale store you see in New York, Paris, or London is stylishly present. The economic dynamo that is modern China has attracted and created great wealth. While we were there, news reports highlighted the fact that eight of the top twenty companies in the world (measured by their valuations on world stock markets) are now Chinese. One hundred of the world's major companies have offices in Shanghai.

The stunning growth has been accompanied by typical consequences: urban sprawl, traffic jams, rapidly rising demand for electrical power, multitudinous new (but hardly clean) coal-fired power plants across the countryside (we saw half a dozen of them in a flight from Beijing to Xi'an), eye-watering air pollution, rapidly worsening income disparity, water capacity and water-quality concerns, water shortages in northern China, and rising urban vs. rural imbalances and tensions.

One could almost forget that the economic progress has not been accompanied by as much political progress—until viewing the formal, reverential, noncritical coverage on China Central TV and across the front pages of the Chinese newspapers of the seventeenth national Congress of the Communist Party in Beijing, which met while we were there. The TV and newspapers treated it all as an epic event, the cameras panning slowly over the aged, stone-faced party leaders, seemingly belying the modern transformation that has occurred all around them. (On the final day of the meeting, the congress *did* replace the vice president and two vice premiers with younger men.)

Nevertheless, China's leaders do tout scientific and technical progress among their highest priorities, something seldom if ever heard anymore from American political leaders. China has tripled its research and development spending since 2000, an increase the U.S. National Science Foundation has called "unprecedented for any country in recent memory." Science and technology have a respect and status among the Chinese people that is enviable in the U.S. They realize that their transformation has been propelled by—in addition to the unleashing of market economic forces—scientific and technological progress. But, as in Western societies, the *results* of science are understood and appreciated far more than the underlying methods and principles of science (including critical thinking and free, open inquiry) that account for its great success.

It was in this remarkable set of circumstances—a society with an ancient cultural heritage rapidly transforming and re-creating itself—that the Center for Inquiry/Transnational's world congress on Scientific Inquiry and Human Well-Being was held in Beijing October 13–15, 2007. Co-sponsored by the China Research Institute for Science Popularization (CRISP, CFI/China) and supported by the China Association for Science and Technology (CAST), both nongovernmental science organizations, the three-day conference addressed the problems facing scientific inquiry and the public understanding of science in the modern world. About a dozen other Chinese academic and scientific institutions also co-sponsored.

Held in the Science Hall of the Beijing Friendship Hotel in the northwest part of the city, the congress enjoyed the hotel's appealing, newly modernized, eight-building, 1,600-room garden complex. Its staff jubilantly celebrated becoming a five-star hotel

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科学探索与人类福祉：提升科学精神与建设和谐社会
Scientific Inquiry and Human Well-being:
Improving Science Spirits and Building Harmony Society
October 13-15, 2007
Beijing, China
主办单位 /Sponsors：
国际探索中心 / Center For Inquiry - Transnational (CFI-Transnational)
中国科普研究所 / China Research Institute for Science Popularization (CRISP, CFI-China)
Paul W. Kurtz
Lin Zixin

Far left: Ren Fujun (CRISP), director of CFI/Beijing, prepares to open the first plenary session of the Beijing Congress. Other panelists, left to right: Qin Dahe, former director of the Chinese National Meteorological Administration; Nobel Laureate Murray Gell-Mann; Cheng Donghong, secretary general of the Chinese Association for Science and Technology (CAST); Paul Kurtz, cochair of the Congress; Lin Zixin, former editor of *Science and Technology Daily,* advocate of sustainability, and critic of Qigong; and philosopher Daniel C. Dennett.

while we were there.

The conference focused on seven topics: science and the public, the scientific method and scientific ethos, scientific inquiry and the paranormal, science communication and the media, scientific inquiry and secular humanism, and science culture and morality.

CRISP executive director Ren Fujun, CAST executive secretary Cheng Donghong, and CFI/Transnational founder and Chairman Paul Kurtz welcomed the five hundred participants, including seventy speakers (about four-fifths from China, one-fifth from the West).

One of the early conference themes was environmental degradation and climate change. It was fitting that this discussion was initiated by Lin Zixin, a far-sighted Chinese leader and science editor who was the host for our 1988 CSICOP visit (which he fondly recalled) investigating then-rampant paranormal claimants in China. His attention has now turned to broader issues. He led off with a summary of his most recent concerns about climate change, the environment, and sustainable development. His view is global. Pollution, fresh water, weather extremes, sea levels, and melting of the Earth's ice are, he said, "common interests of humanity."

He cited the Stern report's warning of "severe damage to social systems," a December 2006 Chinese national report on climate change's expected negative impact on China's agriculture, and the World Wildlife Federation's Living Planet of 2006 report stating that the productivity of the environment will decrease. He noted that China's president attaches great importance to sustainable development in China and said a five-year pollution-control plan is essential.

A report on "The Crisis of the Yellow River Source" decried the displacement of the torrential waters of the Yellow River of the past by vast sandy areas. China must become a "water-conservation and energy-conservation society," Lin said. "We have a great responsibility for protecting Earth's ecosystems."

The noted Chinese geography professor and climatologist/glaciologist (and academician of the Chinese Academy of Sciences) Qin Dahe described in detail, with numerous charts and graphs, the concerns and conclusions of the Intergovernmental Panel on Climate Change (IPCC). He included a new report issued the day before on human and natural drivers of climate change, referring to "very positive evidence of human causes of global warming."

Professor Qin is a member of IPCC Working Group I on the physical science basis of climate change. It is perhaps a mark of Chinese modesty that he left until the very end of his talk a newly prepared slide. It announced that the night before, the Nobel Committee had awarded the 2007 Nobel Peace Prize jointly to the IPCC and former U.S. vice president Al Gore "for their efforts to build up and disseminate greater knowledge about man-made climate change, and to lay the foundations for the measures that

Barry Karr, Paul Kurtz, Wang Jianguo, deputy director of the China Science and Technology Museum, and David Koepsell at the construction site of the museum's huge, new building on the grounds of the 2008 Beijing Olympics park.

are needed to counteract such change."

"I am very proud," Qin said. "I am one small member of IPCC."

Nobel laureate physicist Murray Gell-Mann had come straight to the China conference from a symposium in Potsdam, Germany. There, he said at the beginning of his China presentation (see sidebar on page 34), a group of fifteen Nobel Prize winners, himself included, had issued a declaration on global climate change: the scientific facts of global warming are a settled matter.

I opened my own remarks on climate change (and the recent controversy about it in the pages of the SKEPTICAL INQUIRER) by noting that when my wife and I visited the Summer Palace on the northwestern outskirts of Beijing before the conference, the atmosphere was so thick that the beautiful gate towers and other features, some with poetic, sky-invoking names like Gate of Dispelling Clouds and Hall of Embracing the Universe, could scarcely be seen across the corner of the lake. I worried that Beijing and other large cities are rapidly losing a precious heritage—a direct and emotional connection with the sky, which has driven both astronomy and public wonder about the cosmos and much poetry and literature. My temerity was immediately punished: The next three days in Beijing were glorious—crystal clear, blue skies. I hope it was not an anomaly, but fear that it was. The following week, everywhere we went the sky was hazy and smog-filled.

Paul Kurtz, in his opening plenary session talk, issued a ringing call for what he called planetary humanism to address the world's biggest problems. "A viable new planetary humanism" to achieve "a safe, secure, and better world should be our overriding obligation." He praised aspects of science that need to be better communicated, especially its objective methods of inquiry. In referring to a scientific worldview, he said he prefers the term "scientific naturalism" to "scientific materialism." Kurtz said science has succeeded because of the use of scientific methods, an essential component of which is skepticism—placing in the cross hairs its own most cherished principles. Skepticism is continuous with common sense, he said, and he called for greater efforts in teaching critical thinkers "how to think."

After the morning plenary session, the conference broke into two lines of concurrent sessions covering virtually every aspect of the conference's stated themes and more.

I'll give just a few examples.

Oxford University chemistry professor and writer Peter Atkins (*Galileo's Finger: The Ten Great Ideas of Science)* spoke on "Science as Culture." Science, as the epitome of rational thought, is a part of human culture, he emphasized. "Science enriches culture."

Enjoyment of science goes hand in hand with understanding science. Atkins advocated that scientists give much greater emphasis to visual information when dealing with the public. "Pictures are the way of propagandizing ideas to the populace," he said, launching into a display of a hundred images. Some chemical ideas can best be conveyed with images—the whole point, he said, is to share with the public the pleasure and deep intellectual satisfaction scientists gain from science by better using visual materials to aid people's comprehension.

Nobel laureate chemist Sir Harold Kroto (co-discoverer of "buckyballs," carbon-60) echoed similar themes with an Internet video presentation on "Science, the Enlightenment, and the Internet." The Periodic Table, Kroto demonstrated, is based on the numbers 1, 2, and 3. "Those three numbers explain all chemistry, all of life," he said. He, like Atkins and others, spoke of the "aesthetic beauty of science." Examples he cited were buckyballs, the hemoglobin molecule, and DNA. Important practical applications can come out of that beauty, he pointed out. Examples are the doping of plastic solar cells with C-60 to increase electricity production and possible future supercomputers based on molecular biology.

French physicist Jean-Claude Pecker, currently general secretary of the International Astronomical Union (who early in the conference spoke on Creationism in Astronomy), discussed science's role in culture in the concluding plenary session. The beauty of science is "not only in its flamboyant properties but in the deeper meaning," he said. Science is everywhere, but that doesn't necessarily mean much.

"We are awash in science. We are confronted with the facts, but the facts only," Pecker said. As a result, "We ignore the logic of the scientific and technical achievements. We ignore the real scientific knowledge. We ignore the real scientific culture. How then can people distinguish science from pseudoscience, cranks, and charlatans?" Scientists must not just report the facts, they must *explain*, he urged.

"Debunking the pseudosciences is a task of science communicators wherever they are," Pecker said. "Explain. Explain. Explain."

Whereas the Internet "is a paradise for cranks," he said, muse-

ums are one of the crossroads of teaching and information and "are generally very good." He recommends building more museums, planetariums, botanical gardens, and zoos.

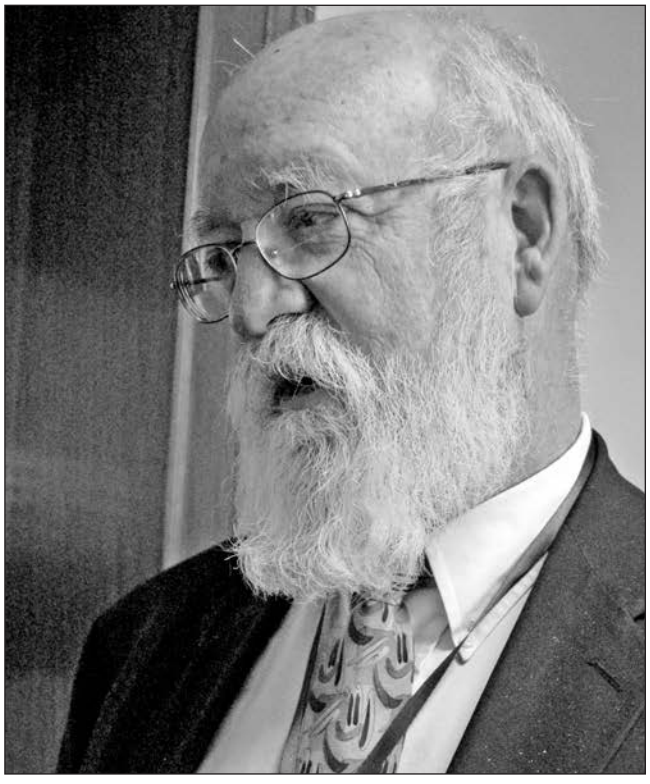
"Science has changed everything," said physicist and writer Lawrence Krauss (*The Physics of Star Trek, Hiding in the Mirror).* He paused: ". . . except how we think and act!" In a lively, fast-paced talk to avoid stringent time limits, Krauss discussed some key aspects of the scientific ethos: honesty, full disclosure (citing evidence for and against one's theory), anti-authoritarianism, egalitarianism, and creativity. He also cited two noted cases of fraud in science (one at Bell Labs, the other at Lawrence Berkeley National Lab) as especially painful examples of when scientists fail to follow that ethos.

But in the public sphere, he said, the greater problem is the continuing governmental interference in science, where science gets distorted in the political process. He cited cases related to stem cells, cancer research, birth control, the environment, the claims of WMDs in Iraq, and others.

Journalists also often have serious problems in dealing properly with scientific controversies, he noted. The journalistic tradition is to believe there are two sides to every story and to write accordingly. Science is different, Krauss said. "Most times one side is simply wrong."

Restoring scientific integrity is essential, Krauss emphasized. Judging by their actions, many people in government seem to take an almost perverse pride in misunderstanding scientific information, allowing themselves to distort it for political ends, Krauss said. "The purpose of education is not to validate ignorance but to overcome it. Ignorance is the enemy."

The noted Russian physicist Edward Kruglyakov, deputy director of the Budker Institute of Nuclear Physics in Novosibirsk, the largest Russian scientific institute, gave a detailed chronicle of the rapid growth of pseudoscience in Russia in the 1990s. As he did in an article for SKEPTICAL INQUIRER ("Why Is Pseudoscience Dangerous?" July/August 2002), Kruglyakov described vivid examples of cases in which pseudoscience has penetrated into high levels of government and society. Russian leader Boris Yeltsin asked Kruglyakov, for instance, if high energy can be released from



Daniel C. Dennett calls for an end to indoctrination of children.

Dennett: Teach Children *All* the Facts about their Religion

Philosopher Daniel Dennett used his summary talk on the final morning of the China conference to call for an end to the indoctrination of children into the religious beliefs of their parents. Yet he doesn't urge censorship—just the opposite. The Tufts University philosopher, known for his passionate atheism as well as his defenses of Darwinian evolution (*Darwin's Dangerous Idea*, *Breaking the Spell*), called for teaching children all about religion.

"Even more important than educating the young about science is to educate them about religion," he said. He proposed educating all children about all religions, including origins, history, myths, and contradictions.

"Toxic religions depend on enforced ignorance of the young," he said. "I propose we teach them about the facts of their own religion their elders don't want them to know." The goal: "So they will not be victimized by their parents' religion. I think we should open the floodgates. Teach children about the world's religions."

Paul Kurtz, in his own closing comments, referred to and reinforced Dennett's remarks. The CFI founder and chairman said among the rights of children is the right not to be indoctrinated into their parents' religion. Instead, they should be exposed to the growing knowledge of the world. "Parents do not 'own' children," said Kurtz. "We should teach children creative thinking and moral understanding and moral principles. That is the best way to bring us all into the twenty-first century."

—K.F.

stone. He had been told that it was possible. Kruglyakov tried to warn him off, but "Yeltsin later allocated 200 million dollars" to the energy-from-stone project.

"Energy" and "informational therapy" are often commonly used as pseudoscientific terms in Russia, usually tied to so-called "torsion fields." Other frequent problems are, in Kruglyakov's words, "preposterous patents" (a patent was granted for the "sympathetic treatment of illnesses with the aid of an aspen stick at the moment of full moon"); "pyramidology" (fifteen large pyramids have been built to "solve mankind's problems" and to "guarantee against cancer"); and fraudulent labels (a $50 label that its sellers claim protects against microwave radiation).

Scott Atran (University of Michigan and National Center for Scientific Research in Paris), Lionel Tiger (Rutgers University), and David Koepsell (Council for Secular Humanism) were among the other Western speakers.

Many of the Chinese scholars and researchers gave talks on the public understanding of science, the popularization of science, and the history of science. It is clear these are all lively fields of academic research in China.

For example, Zeng Guoping of Tsinghua University in Beijing, in his remarks on the public understanding of science at the closing plenary session, described the results of surveys in China. Superstition is "fairly high toward folk matters," he said, but China's people "are enthusiastic and interested in science." He said the level of interest is higher than in Europe, the U.S., or Japan. Nevertheless, although the interest in science is high, the level of scientific literacy is low, a complaint heard in the U.S. as well.

Television is the main source of science information for the Chinese public, he said. Newspapers are another. Because Internet availability in China is still lower than in the West, it is not a primary source of science news. As for evolution, "The people believe in evolution, not creationism," Guoping said. Atheism is linked to evolution, but, he said atheism doesn't have the same negative connotations in China as in the U.S. And in China there is great

Gell-Mann: Reality is Out There . . . and It's Beautiful

In case you were wondering, there really is a reality out there independent of human observers. That point—often disputed in philosophical discussions by the intellectual cognoscenti—comes from one who has accomplished his own deep investigations into the fundamental realms of physical reality: physicist and CSI Fellow Murray Gell-Mann, who won the 1969 Nobel Prize in physics for his work leading up to the discovery of the quark, which he predicted and named.

Gell-Mann spoke at the China conference opening plenary session on "Is Nature Conformable to Itself?" But before launching into that topic, he fired some arrows at certain enemies of science. He cited "a number of tendencies" toward "hostility to science" among fundamentalists, governments, and postmodern scholars. As for the latter, he said, "I call them 'post-rational' or 'post-intelligent.'"

The laws of physics "are out there," Gell-Mann emphasized. "These laws are not just created by the human mind."

It is scientists' job to discover them, and beauty, he said, as did Einstein, is a guide to truth. "What is especially striking and remarkable is that in fundamental physics a beautiful or elegant theory is more likely to be right than a theory that is inelegant."

What do we mean by beauty or elegance? "A theory appears beautiful or elegant—or simple, if you prefer—when it can be expressed concisely in terms of mathematics we already have."

Inherent in this discussion is the search for a basic law that would take the form of a unified field theory of all the fundamental forces and all the elementary particles. Yet Gell-Mann scorned the often-used phrase "theory of everything." He said such a basic law would predict possibilities, but it can't predict everything because contingency plays a heavy role.

"The basic law cannot be 'a theory of everything' because it doesn't include these zillions of accidents that along with basic law determine the history of the universe. We should never use that term 'theory of everything.'"

Life and mind can emerge from the laws of physics and chemistry, he said, but all scientific fields must be studied and valued at their own levels. "Reductionism is not wrong, but it is impractical."

"It does not detract from achievements of humans to know that our intelligence and self-awareness have emerged from the laws of physics and biology, plus accidents."

What does he mean by nature being conformable to itself? Gell-Mann began with the old analogy of peeling away an onion to discover more and more layers of reality. As we go to higher and higher energies, he said, "the next onion skin resembles the previous one to some extent. There is a self-similarity." He said Isaac Newton even noticed this in the inverse law effect.

—*K.F.*

interest and support for "post-academic science," or industrial science, because of its role in increasing the gross domestic product, or GDP.

Sun Xian of the Chinese Association for Science and Technology and the China Science and Technology Museum (who has been a visiting scholar at the Center for Inquiry in Amherst) spoke of the difficulty of promoting scientific rationality among Chinese young people. She said many Chinese experts and scholars in recent years have been studying that problem. Among their observations: Young people are intrigued but puzzled by "stupid superstition" (her words) and "extraordinary natural occurrences." They lack approaches in rational thinking that would enable them to make rational judgments on such mystical phenomena, and schools and society are short in giving such education. Despite devoting several years to the promotion of the scientific attitude in China, she said, researchers "found it still a heavy responsibility and an arduous task to fulfill."

Conference co-chair Ren Fujan, in his remarks at the closing plenary session, said "China is now in a great flourish of development in science popularization." He is a professor at three Chinese universities, executive director of CRISP, and editor-in-chief of the Chinese academic *Journal of Science Popularization*, besides chairing the Center for Inquiry/China group. In China, a 2002 law encourages science popularization, and he said the Center for Inquiry's China branch intends to push even more in that direction. He said CFI will promote science and science education, encourage the integration of science and the humanities, study science literacy, spread scientific knowledge in science, study the theory of science popularization, form volunteer teams to serve local science popularization, and enter into broader cooperation with CFI/Transnational.

"Scientific Inquiry and Human Well-Being" was truly the world congress's theme, and CFI founder Paul Kurtz concluded the three-day affair by broadening the discussion even more—to moral and ethical concerns. "Science must transcend any political boundaries," he said. "We want to develop the appreciation of science, its methodology, its outlook." And, he said, we are interested in "the practical application of scientific methodology to ethics and moral principles." Our moral systems are too often based on ancient dogmas, he said. They must instead be informed by modern scientific knowledge. Just as science must transcend political concerns, "A number of ethical principles and moral values transcend culture," he said.

Kurtz, always a philosopher in the best sense, spoke movingly of "the common moral decencies." Among his examples were integrity, trustworthiness, benevolence, and fairness. He also referred to the rights of the individual and certain "excellences" that should be pursued: good health, self control and moderation, self respect and self-esteem, high motivation, the capacity for love, caring for other sentient beings, a commitment to beloved causes,

Nobel Laureate Murray Gell-Mann with a portrait of Isaac Newton at the Beijing Science Hall (conference hall).

a sense of *joi de vivre*, a quest to achieve and to create, a generalized goodwill toward others and oneself, the use of reason, courage ("the audacity to succeed"), altruism, the mitigation of suffering and sorrow, and empathy for others.

He seemed almost to be willing these characteristics and values onto a planet that sorely needs them. And on that high-toned plane, an invigorating conference in a dynamic, rapidly changing part of the world came to an end. □

The New China and the Old

Twenty years of CSI and CFI interactions with China help reinforce Chinese scholars' efforts in boosting scientific understanding and attaining some degree of harmony in a complex country grappling with an incredible development boom. It is in our interests to continue to work closely with the Chinese, and we intend to do so.

PAUL KURTZ

The Eleventh World Congress of Centers for Inquiry/Transnational convened in Beijing in October 2007, the culmination of almost twenty years of interchange between the Center for Inquiry and Chinese scientists. Inasmuch as Ken Frazier has so eloquently depicted the highlights of the Congress in this issue of SKEPTICAL INQUIRER, I will focus on the reasons for the Congress and what we hope will ensue from it. Like Frazier, I was fascinated by the remarkable changes that have occurred in China since our first visit in 1988. Lin Zixin, former editor of *Science and Technology Daily*, the largest-circulation scientific newspaper in the world, had invited the Committee for the Scientific Investigation of Claims of the Paranormal

(CSICOP) to visit China. Chinese scientists at that time, he said, were concerned about the growth of paranormal and occult beliefs. They wished to critically examine paranormal claims and assess the validity of external Qigong and the reality of Chi, psychokinesis, and alleged psychic diagnoses of medical ailments.

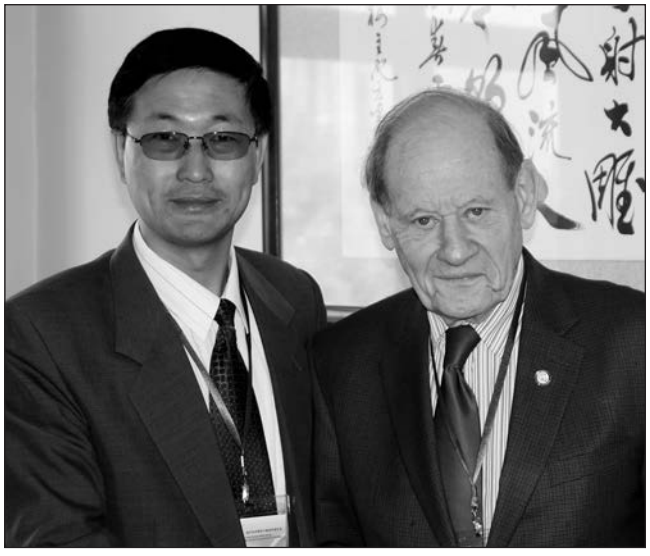
We gladly accepted the invitation and gathered a delegation of six well-known skeptics from North America, including Frazier, James Randi, James Alcock, Barry Karr, Philip Klass, and myself. We did not find any evidence of "extraordinary" paranormal powers and issued a report to that effect (see SI's Summer and Fall issues, 1988).

We noted the chutzpah displayed by psychics, whether adults or children (much had been made at that time about so-called gifted children), who tried but didn't succeed in hoodwinking us. Intrigued by our methods of testing, our Chinese hosts wanted to remain in contact with us. Actually, the Chinese Association for Science and Technology (CAST), a coalition of over 180 science organizations, sponsored the exchange program. CAST, a nongovernmental organization, is somewhat equivalent to the American Association for the Advancement of Science (AAAS).

The Chinese were especially interested in how they could raise the public's appreciation and understanding of science, combat superstition, and improve scientific illiteracy. In time they created a new organization, the Chinese Research Institute for the Popularization of Science (CRISP), which overlapped with CSICOP in its concern with the prevalence of antiscientific attitudes and the public's captivation with parapsychology, UFO abductions, astrology, alternative healing, and pseudoscience in general.

In the early 1990s, CSICOP became an integral part of the Center for Inquiry/Transnational. It has since changed its name to the Committee for Skeptical Inquiry (CSI) and broadened its agenda to defend science, reason, and free inquiry in every area of human interest. The Council for Secular Humanism (CSH) also became part of the Center for Inquiry. It was especially interested in responding to fundamentalist attacks on evolution and naturalistic methodology. CFI added to its agenda the defense of secularism and advanced humanist values not rooted in religion but secular in nature. The Chinese became interested in questions concerning individual morality and happiness, which were similar to the moral virtues of Confucianism, so they found this aspect of our work useful.

The agenda of CFI continued to interest Chinese scientists, who sent delegations to each of our Skeptics World Congresses (held in Heidelberg, Germany; Sydney, Australia; Padua, Italy; and Burbank and Amherst in the United States). More explicitly, they began to send dozens of students, scholars, and officials every year to the Summer Institute of the Center for Inquiry in Amherst, New York, and they translated many of our articles and books. CFI responded by sending two additional teams to lecture in China, and this eventually led to the establishment of a new Center for Inquiry in Beijing and the co-sponsorship of the Eleventh World Congress by the Centers for Inquiry (co-hosted by CAST, CRISP, CFI/Beijing, the Chinese Academy of Science, and many top universities and scientific institutes). CFI/Transnational was pleased to send a delegation of twenty distinguished scientists and philosophers from several countries to the Eleventh World Congress.



Ren Fujun, executive director of CFI/Beijing, with Paul Kurtz.

The basic theme of the World Congress was development of the public's understanding of science—its methods of inquiry, its naturalistic worldview, and the relationship of science to ethics. These topics are relevant to many societies, but also to the planetary community. The Chinese are concerned with maintaining internal harmony within China and especially expressed worry about global warming and environmental pollution of the atmosphere and water resources. Although there is a preponderance of evidence about the reality of global warming, Ken Frazier pointed out in his paper, a minority of readers of SKEPTICAL INQUIRER adamantly claim there isn't a problem.

All told, some seventy papers—many provocative—were delivered at the Congress, including those by eminent Chinese scientists, such as Professor Qin Dahe, renowned climatologist and meteorologist and Chinese representative to the world agency concerned with global warming (that had just received a

Paul Kurtz is a professor emeritus of philosophy at the State University of New York at Buffalo and the chair of the Center for Inquiry and the editor in chief of Free Inquiry.

Cheng Donghong, secretary general of the Chinese Association for Science and Technology (CAST).

Nobel Prize), Cheng Donghong, executive secretary of CAST, and Ren Fujun, the energetic head of CRISP. Ren and I co-chaired the Congress.

Ren said that they wished to expand the role of the Center for Inquiry in China; the enterprise of science popularization has reached an opportune moment as the country grapples with an incredible development boom. It is important, he said, to continue research cooperation between CRISP, CFI/Beijing, and CFI/Transnational to increase the number of Chinese researchers who will participate in summer training classes at the CFI Institute in Amherst, New York, and to co-sponsor international conferences. Many of our Chinese counterparts expressed a desire to establish CFIs in other cities in China. On our trip to Shanghai we met Wang Xin, director of the Shanghai Association for Science and Technology in their new building, and he affirmed that they would like to establish a CFI/Shanghai.

Thus, the Eleventh World Congress ratified and solidified twenty years of interchange and pledged the continued cooperation in furthering the public's understanding of science.

China's Soaring Economy

The entire world community is vitally interested in the Chinese economy, and many international conglomerates have opened branch offices and invested heavily in China. Friendly governments have supported this. The world is eager to trade with the Chinese, and many countries are importing their goods and services at an increasing rate. This has led to complaints about displaced workers at home, because large companies have discovered that they can manufacture products in China and ship them back cheaper than they can produce them in their own countries, sparking tremendous economic expansion in China. Encouraged by its economic vitality, foreign capital investment in China is increasing. This is similar to what happened historically elsewhere when foreign capital enabled countries to develop.

The opening of China to the free market in the past two decades has led to its explosive economic growth. As Frazier notes, of the leading twenty companies in the world, in terms of stock valuation, eight of them are Chinese (including China Mobile, China Telecom, PetroChina, etc.). The sudden emergence of a new class of billionaires in China is an astounding development. Indeed, there are an estimated 100 billionaires living in mainland China (according to the *Hurun Report* and *Forbes*). Most of the wealth comes from real estate, construction, and manufacturing. The wealthiest person on the list is Yang Huiyan, who received a $17.5 billion gift of stock from her father, a real estate developer. Zhang Yin is worth $10 billion due to a surge in the share prices of his Nine Dragons Paper holdings (he owns 72 percent); Yu Rongman, owner of Shimao Property holdings, has $7.5 billion in wealth. And Huang Guangyu, founder of Gome Electrical Appliances, is worth $6 billion according to estimates. Most of this wealth comes from a real estate boom and soaring prices on the Shanghai and Hong Kong exchanges (similar to Google). The Shanghai and Hong Kong stock markets made more money last year from public offerings than the New York Stock Exchange and NASDAQ combined. China is now the chief engine of economic growth in the world—projections place it second to the U.S. by 2015.

This indicates, perhaps, that China is hardly a Communist country; it has a mixed economy—the private sector continues to grow by leaps and bounds. Official Chinese statistics indicate that privately owned companies comprise one-third of the total economy, but I think that this figure is too low. Chinese capitalism is now the dominant force accelerating the economy. What China is able to do on top of that, which other capitalist countries cannot, is use the power of the State to plan large projects and harness both private and public companies to achieve them—such as the vast effort to reconstruct a large section of Beijing for the Olympic Games.

Environmental, Societal Challenges

Like Frazier, I was stunned by the evident progress that China had made in the nineteen years since we were there. Everywhere we went new construction was bustling—factories and stores, highway systems, skyscrapers and apartment houses, and entire

new towns and cities. China uses one-third of the cranes in the world, according to estimates. The four cities we visited—Beijing, Xi'an, Shanghai, and Guilin (we had visited the first three on our last trip)—are being transformed at a breakneck pace. The Chinese we met on the streets in restaurants and stores seemed proud of these accomplishments, which led to a noticeable improvement in the standard of living, at least in the major cities. This was especially the case in Shanghai, which is truly breathtaking. Daniel Dennett cajoled us into taking a boat ride around the Pudong part of Shanghai. At night the city is dazzling—almost nothing had been constructed when we were there in 1988. It was as if two new Manhattans had sprung up out of nowhere. There are dramatic plans to continue new construction, we were informed by a director of Shanghai's Urban Planning Exhibition Center where a model city of the future was on display.

We enjoyed royal treatment by our Chinese hosts, first in Beijing, where we were chauffeured by limousine to see the massive preparations for the upcoming 2008 Olympic Games. It appeared to us that they had a long way to go if they are to complete the Olympic facilities on time. But the construction manager assured us that they were working three shifts around the clock and that it would be finished. We didn't doubt that; China has a vast pool of cheap labor that they can apply to such projects. The rest of the world has discovered the availability of this skilled labor force, transferring vast new industries to China and abandoning their own industrial bases for the allure of Chinese productivity.

Incredibly, the rate of growth of the Gross Domestic Product (GDP) has been 10 to 11 percent over the last four years. In gross terms, it reached $2.7 trillion U.S. dollars in 2006—this is one-fourth that of the U.S., though China has four times the U.S. population. The Chinese hope to quadruple their economy by 2020, despite unforeseen obstacles that may slow it down.

We found the streets of China choked with automobile congestion. Surprisingly, many of the cars in Beijing and Shanghai are four-door, replacing the ubiquitous bicycles that we saw on our earlier trip. As Frazier observed, the air pollution was thick, far worse than Los Angeles on its bad days. One Chinese official told me that a recent public poll asked the Chinese what they most wanted: a huge majority responded that their main interest was to own a large four-door automobile! Given the vast increase in energy consumption, the environmental problems that China faces are awesome. The Chinese government is aware of the need to reach sustainable development without pollution. By all accounts, 85 percent of the streams and rivers are fouled or rancid, depleting fresh water supplies. China produces 70 percent of the world's farmed fish in coastal cities and in the mighty Yangtze River, frequently contaminated by

Lin Zixin, former editor of *Science and Technology Daily*.

mercury, lead, and other toxic chemicals. Murray Gell-Mann reported that Chinese officials said that China is constructing two new power plants per week, fired by polluting coal, but they cannot get provincial leaders to reduce emissions. Moreover, we did not see any great emphasis on the conservation of energy by producing smaller cars (they seemed to have followed Detroit) or dimming their bright lights (much like Las Vegas and Broadway). In this sense, they seem to be emulating America in wasteful, conspicuous consumption, though the government has recently issued guidelines to radically alter how they grow.

No doubt the chief cause of China's energy/resource/environmental problem is the fact that the population keeps growing. The streets are teeming with pedestrians. Many years ago China instituted a stringent one child per/family policy to restrain population growth. Criticized by the Western world for its restraint on freedom of choice, the Chinese nevertheless felt it was an urgent necessity. This has had unexpected consequences, however, for there may not be enough workers to support their aging parents, the custom in ancient China. The growth of the population is due *primarily to the decline of the death rate* because of better nutrition and sanitary conditions. The average lifespan has risen from thirty-five years to seventy-two years in the past four decades. Were China to catch up with Japan (where the average lifespan is now over eighty), this would place still greater strains on natural resources. Demographic projections indicate that China will add 300,000,000 people by the year 2030—equivalent to the entire U.S. population! The most likely place they can migrate to is Western China—even then, will China have enough resources to feed and satisfy its vast population?

Another urgent problem confronting them is the great disparity in wealth, which could lead to intense internal conflicts.

Hence, the Chinese government has focused on *harmony* as a central social goal. "Harmony" is Confucian in origin and a moral norm. Traditional Confucian thought emphasizes the cultivation of a virtuous and happy life. One way to do this is to fulfill your station and its duties; another is to reach personal fulfillment. Presumably, in a socialist society, it is to strive for the common good. In any case, there is now interest in classical China, something spurned by Mao.

Overcoming poverty is now a focus of Chinese leadership. The per-capita income in 2006, according to government statistics (which may or may not be reliable), was approximately $2,042, up nearly 20 percent from the previous year, yet still much lower than other industrial countries of Europe, the U.S., and Japan. In major cities such as Shanghai, the per-capita income is approximately $4,000 per person, but in the countryside (we visited model farms outside of Guilin) the peasants only earn $300 per year, barely enough for food and shelter. They live at a subsistence level and use farming methods that go back millennia. Large numbers of people are leaving rural areas for the cities—but there are not enough jobs for everyone. Hence, rising levels of affluence will no doubt lead to a comparative rise in aspirations. Demands from poorer regions point to an explosive powder keg. There are already reports of tens of thousands of protests throughout the country. Perhaps that is why, although the Chinese leadership is strenuously attempting to expand the GDP, it is now emphasizing the need for distribution of consumer goods in poorer areas to achieve social harmony.

One thing is clear: China is *not* a "Cold War" Communist country. Although its government may be authoritarian, it is not totalitarian; it encourages innovation and enterprise and tolerates some diversity. It has a pluralistic economy with a strong capitalist sector and a great number of privately held stores and restaurants. Former premier Deng Xiaoping's policies are heralded as the salvation of China. The leadership plans to quadruple its GDP by 2020, and thereby increase the per-capita income and standard of living. There is a growing middle class in major industrial centers and cities of perhaps 15 to 20 million people and a large underclass longing to share in the good life. For these reasons, the Chinese continue to keep the throttles on "high" in order to increase production, enabling a wider distribution of consumer goods and services to vast numbers of the indigent population.

China's Political Future

While we were in Beijing, the Seventeenth National Congress of the Chinese Communist Party (73 million members) was in session. Some 2,200 delegates attended. Viewing the meetings on television news each evening (on an English-translation channel) seemed like an anachronism. Two-thousand Communist Party (CPC) officials were shown in the People's Hall—the men were dressed in somber, dark suits or uniforms and the women in staid attire. The Congress opened with a statement of allegiance to Marxism/Leninism. There seemed almost no dissent in the sessions of the Congress, at least none was broadcast. A Central Committee (Politburo) and a standing committee of seven run China. They call it collective leadership. Hu Jinatao, head of the Communist Party, laid out the new party line at the Congress. He pointed out that China had not yet reached socialism and that their goal was to move toward "socialism with Chinese characteristics." The aim, he said, would be to strive for "a moderately prosperous society," which they hoped to reach by 2020. The agenda sounded—at least on paper—worthy: it recognized the need of the people to "exercise democratic rights" and to act only under "the constitution and by the rule of law." According to *China Daily* (Oct. 28, 2007), Chinese democracy will seek "to guarantee freedom, equality, and other rights of citizens." Yu Keping of the CPC Central Committee declared that "universal values serve to bolster political reforms," and these include freedom, justice, democracy, equality, and human rights. Presumably, this will contribute to a harmonious society.

Hu promised to appoint more noncommunists as cabinet ministers to governmental positions. The CPC announced on the eve of the Congress the appointment of two noncommunists, Wan Gang, the new Minister of Science and Technology, and Chen Zu, the new Minster of Health, the first such appointees since the 1970s.

Hu also said that although China will continue its rapid growth, it needs to be balanced and sustainable—the Chinese press hailed this as a new "conservation culture." Reducing the depletion of natural resources and providing environmental protection is the only way to do this. China also plans, he said, to reduce absolute poverty with a reasonable system of income distribution and a growing middle class, guaranteeing everyone a basic standard of living. Thus, they hope to reverse the growing disparity in income. China does not have universal health care, a system of social security, or universal education—services which virtually all of the industrialized democracies of the world have. Compulsory education, where it exists in China, is only for nine years, and large sectors of the country have not even implemented that. One member of the cadre said to me plaintively that the glamour of Beijing and Shanghai do not reflect the massive catch-up that China needs to achieve in the countryside if it is to fulfill its ambitious goals.

The provision of the Communist Party's Congress that I found most surprising is the supremacy it accords science and technology in its future plans. The Party Congress—it is perhaps the only major power in the world to do so—supports as its highest priority the "scientific outlook on development," a goal adopted as an amendment to the CPC Constitution.

China is now the fastest-growing sustainer of scientific research and development in the world with a growth rate of 18 percent per year over the past five years. It is now in third place behind the U.S. and Japan and moving up fast. The U.S., Japan, and Europe had an overall growth rate in research and development of only 2.9 percent per year. By all reports, the equipment in its laboratories is equal in quality to the rest of the world. Moreover, the Chinese are seeking to attract the brightest researchers to China, and they are eager for partnerships. (See the lead editorial in *Science*, "Chinese Science on the Move," by Alan I. Leshner and Vaughan Turekian, December 7, 2007.)

Hu, trained as an engineer, was quoted as saying: "Uphold science; don't be ignorant and unenlightened." What a contrast with the current U.S. administration where "intelligent design" theorists oppose evolution and stem-cell research is effectively thwarted. Traditional Marxist theory emphasizes that the expansion of "the forces of production" is essential to economic growth—the Chinese have recognized that increased expenditures for science and technology are crucial to their effective development.

What role does socialism play in China's future? China is supposed to be in the preliminary stages of socialism. According to Hu, the first aspect is that China should be "people-oriented," and second, its development should be "sustainable and contribute to social harmony." They now recognize that basing policies on economic GDP indexes alone is insufficient. They need to pay attention to wasted resources, social unrest, environmental degradation, and regional imbalances. China has vowed to reduce its per-capita energy consumption 20 percent by 2010 and emission of pollutants by 10 percent in the same period. Are these mere ideological slogans, or will China embrace these challenges as it continues to lunge ahead?

More important perhaps for the future is whether there will be conflict within the "relationships of production" between two powerful forces—the free market/capitalist system and its powerful billionaires and thriving middle class versus the Communist Party cadre. Castrating the private sector could halt Chinese productive power as part of the global economy. On the other hand, if its power grows, would it in time dislodge the Communist bureaucracy and lead to a collapse of the system or the emergence of an outright military dictatorship? Will the diplomatic policies of the current regime be supplanted by hostile confrontations in the future? All of these possible scenarios are disturbing, for it may lead to China's decline, and given the interdependence of the entire global economy, could lead to the unraveling of the world economic-political system as we know it.

Prudence suggests that we should continue to work closely with the Chinese and encourage the democratization of the political system, the growth of other parties besides the Communist Party, the right of dissent, a free press, respect for human rights, and widespread participation and grassroots involvement in the policies of the country.

Paul Kurtz, Kendrick Frazier, and Ruth Frazier in the Shanghai Science Museum.

China is perhaps the oldest continuous culture on the planet with strong family traditions, a set of moral virtues with deep roots in its past, and resourceful, intelligent, and hard-working people. Skilled in business, artful in negotiation, we should not push them—backs to the wall—into a classical confrontation of national power-politics. We should continue to welcome them into the new planetary civilization emerging in this age of instantaneous electronic communication where cultural, scientific, philosophical, artistic, and economic exchange is vital for everyone.

I should add that our contacts with the Chinese people over the years, whether scientists, professors, students, or ordinary folks, have been most gratifying. The Chinese invariably bestow gifts when people visit them or when they travel abroad. They are generous hosts. Everywhere we went we were feted with sumptuous banquets overflowing with savory dishes, and of course hot tea. The Chinese people we met were invariably polite and well spoken and sought not to offend. They display the refined manners that their ancient civilization and rich culture have cultivated for so long.

In its small way, the Center for Inquiry intends to embrace continuous dialogue, intercommunication, and interchange with the Chinese people. Hopefully, this will lead in a modest way not only to the development of a more peaceful and humanistic world, but one that recognizes the mutual interests and needs of everyone in the planetary community as we try to work out values that we share. □

Given the recent debate in our pages over global warming and climate change, we invited Bjorn Lomborg, author of Cool It! The Skeptical Environmentalist's Guide to Global Warming, *for his perspective. — EDITOR*

Let's Keep Our Cool about Global Warming

BJORN LOMBORG

When it comes to climate change, we need to cool our dialogue and consider the arguments for and against different policy options. In the heat of a loud and obnoxious debate, facts and reason lose out.

There is a kind of choreographed screaming about climate change from both sides of the debate. Discussion would be on much firmer ground if we could actually hear the arguments and the facts and then sensibly debate long-term solutions.

Man-made climate change is certainly a problem, but it is categorically not the end of the world. Take the rise in sea levels as one example of how the volume of the screaming is unmatched by the facts. In its 2007 report, the United Nations estimates that sea levels will rise about a foot over the remainder of the century.[1] While this is not a trivial amount, it is also important to realize that it is not unknown to mankind: since 1860, we have experienced a sea level rise of about a foot without major disruptions.[2] It is also important to realize that the new prediction is lower than previous Intergovernmental Panel on Climate Change (IPCC) estimates and much lower than the expectations from the 1990s of more than two feet and the 1980s, when the Environmental Protection Agency projected more than six feet.[3]

We dealt with rising sea levels in the past century, and we will continue to do so in this century. It will be problematic, but it is incorrect to posit the rise as the end of civilization.

We will actually lose very little dry land to the rise in sea levels. It is estimated that almost all nations in the world will establish maximal coastal protection almost everywhere, simply because doing so is fairly cheap. For more than 180 of the world's 192 nations, coastal protection will cost less than 0.1 percent GDP and approach 100 percent protection.[4]

The rise in sea level will be a much bigger problem for poor countries. The most affected nation will be Micronesia, a federation of 607 small islands in the West Pacific with a total land area only four times larger than Washington, D.C.[5] If nothing were done, Micronesia would lose some 21 percent of its area by the end of the century (Tol 2004, 5). With coastal protection, it will lose just 0.18 percent of its land area. However, if we instead opt for cuts in carbon emissions and thus reduce both the sea level rise and economic growth, Micronesia will end up losing a *larger* land area. The increase in wealth for poor nations is more important than sea levels: poorer nations will be less able to defend themselves against rising waters, even if they rise more slowly. This is the same for other vulnerable nations: Tuvalu, the Maldives, Vietnam, and Bangladesh.

The point is that we cannot just talk about CO_2 when we talk about climate change. The dialogue needs to include *both* considerations about carbon emissions and economics for the benefit of humans and the environment. Presumably, our goal is not just to cut carbon emissions, but to do the best we can for people and the environment.

We should take action on climate change, but we need to be realistic. The U.K has arguably engaged in the most aggressive rhetoric about climate change. Since the Labour government promised in 1997 to cut emissions by a further 15 percent by 2010, emissions have *increased* 3 percent.[6] American emissions during the Clinton/Gore administration increased 28 percent.

Look at our past behavior: at the Earth Summit in Rio in 1992, nations promised to cut emissions back to 1990 levels by 2000 (UNFCCC 1992, 4.2a). The member countries of the Organisation for Economic Cooperation and Development (OECD) overshot their target in 2000 by more than 12 percent.

Many believe that dramatic political action will follow if people only knew better and elected better politicians.[7] Despite the European Union's enthusiasm for the Kyoto Protocol on Climate Change—and a greater awareness and concern over global warming in Europe than in the United States—emissions per person since 1990 have remained stable in the U.S. while E.U. emissions have *increased* 4 percent (EIA 2006).

Even if the wealthy nations managed to reign in their emissions, the majority of this century's emissions will come from developing countries—which are responsible for about 40 percent of annual carbon emissions; this is likely to increase to 75 percent by the end of the century.[8]

Funding research and development globally would create a momentum that could recapture the vision of delivering both a low-carbon and high-income world.

In a surprisingly candid statement from Tony Blair at the Clinton Global Initiative, he pointed out:

> I think if we are going to get action on this, we have got to start from the brutal honesty about the politics of how we deal with it. The truth is no country is going to cut its growth or consumption substantially in the light of a long-term environmental problem. What countries are prepared to do is to try to work together cooperatively to deal with this problem in a way that allows us to develop the science and technology in a beneficial way. (Clinton Global Initiative 2005, 15)

Similarly, one of the top economic researchers tells us: "Deep cuts in emissions will only be achieved if alternative energy technologies become available at reasonable prices" (Tol 2007, 430). We need to engage in a sensible debate about how to tax CO_2. If we set the tax too low, we emit too much. If we set it too high, we end up much poorer without doing enough to reduce warming.

In the largest review of all of the literature's 103 estimates, climate economist Richard Tol makes two important points.

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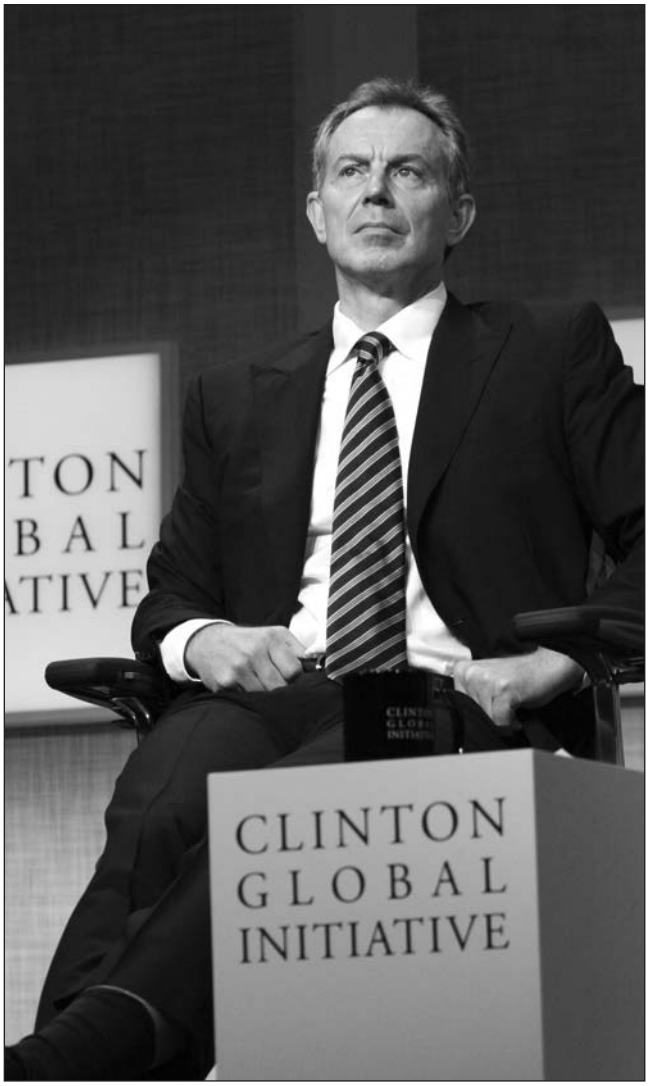

Former Prime Minister Tony Blair appeared at the Clinton Global Initiative annual meeting in New York City. Photo credit: Janet Mayer/Splash News. [Photo via Newscom]

First, the really scary, high estimates typically have not been subjected to peer review and published. In his words: "studies with better methods yield lower estimates with smaller uncertainties." Second, with reasonable assumptions, the cost is very unlikely to be higher than $14 per ton of CO_2 and likely to be much smaller (Tol 2005).[9] When I specifically asked him for his best guess, he wasn't too enthusiastic about shedding his cautiousness—as few true researchers invariably are—but gave the estimate of $2 per ton of CO_2.[10]

Therefore, I believe that we should tax CO_2 at the economically feasible level of about $2/ton, or maximally $14/ton. Yet, let us not expect this will make any major difference. Such a tax would cut emissions by 5 percent and reduce temperatures by 0.16°F. And before we scoff at 5 percent, let us remember that the Kyoto protocol, at the cost of 10 years of political and economic toil, will reduce emissions by just 0.4 percent by 2010.[11]

Neither a tax nor Kyoto nor draconian proposals for future cuts move us closer toward finding better options for the future. Research and development in renewable energy and energy efficiency is at its lowest for twenty-five years. Instead, we need to find a way that allows us to "develop the science and technology in a beneficial way," a way that enables us to provide alternative energy technologies at reasonable prices. It will take the better part of a century and will need a political will spanning parties, continents, and generations. We need to be in for the long haul and develop cost-effective strategies that won't splinter regardless of overarching ambitions or false directions.

This is why one of our generational challenges should be for *all nations to commit themselves to spending 0.05 percent of GDP in research and development of noncarbon emitting energy technologies.* This is a tenfold increase on current expenditures yet would cost a relatively minor $25 billion per year (seven times cheaper than Kyoto and many more times cheaper than Kyoto II). Such a commitment could include all nations, with wealthier nations paying the larger share, and would let each country focus on its own future vision of energy needs, whether that means concentrating on renewable sources, nuclear energy, fusion, carbon storage, conservation, or searching for new and more exotic opportunities.

Funding research and development globally would create a momentum that could recapture the vision of delivering both a low-carbon and high-income world. Lower energy costs and high spin-off innovation are potential benefits that possibly avoid ever stronger temptations to free-riding and the ever tougher negotiations over increasingly restrictive Kyoto Protocol-style treaties. A global financial commitment makes it plausible to envision stabilizing climate changes at reasonable levels.

I believe it would be the way to bridge a century of parties, continents, and generations, creating a sustainable, low-cost opportunity to create the alternative energy technologies that will power the future.

To move toward this goal we need to create sensible policy dialogue. This requires us to talk openly about priorities. Often there is strong sentiment in any public discussion that we should do *anything* required to make a situation better. But clearly we don't actually do that. When we talk about schools, we know that more teachers would likely provide our children with a better education.[12] Yet we do not hire more teachers simply because we also have to spend money in other areas. When we talk about hospitals, we know that access to better equipment is likely to provide better treatment, yet we don't supply an infinite amount of resources.[13] When we talk about the environment, we know tougher restrictions will mean better protection, but this also comes with higher costs.

Consider traffic fatalities, which are one of the ten leading causes of deaths in the world. In the U.S., 42,600 people die in traffic accidents and 2.8 million people are injured each year (USCB, 2006, 672). Globally, it is estimated that 1.2 million people die from traffic accidents and 50 million are injured every year (Lopez, Mathers, Ezzati, Jamison, and Murray 2006, 1751; WHO 2002, 72; 2004, 3, 172).

About 2 percent of all deaths in the world are traffic-related and about 90 percent of the traffic deaths occur in third world countries (WHO 2004, 172). The total cost is a phenomenal $512 billion a year (WHO 2004, 5). Due to increasing traffic (especially in the third world) and due to ever better health con-

ditions, the World Heath Organization estimates that by 2020, traffic fatalities will be the second leading cause of death in the world, after heart disease.[14]

Amazingly, we have the technology to make all of this go away. We could instantly save 1.2 million humans and eliminate $500 billion worth of damage. We would particularly help the third world. The answer is simply lowering speed limits to 5 mph. We could avoid almost all of the 50 million injuries each year. But of course we will not do this. Why? The simple answer that almost all of us would offer is that the benefits from driving moderately fast far outweigh the costs. While the cost is obvious in terms of those killed and maimed, the benefits are much more prosaic and dispersed but nonetheless important—traffic interconnects our society by bringing goods at competitive prices to where we live and bringing people together to where we work, and lets us live where we like while allowing us to visit and meet with many others. A world moving only at 5 mph is a world gone medieval.

This is not meant to be flippant. We really could solve one of the world's top problems if we wanted. We know traffic deaths are almost entirely caused by man. We have the technology to reduce deaths to zero. Yet we persist in exacerbating the problem each year, making traffic an ever-bigger killer.

I suggest that the comparison with global warming is insightful; we have the technology to reduce it to zero, yet we seem to persist in going ahead and exacerbating the problem each year, causing temperatures to continue to increase to new heights by 2020. Why? Because the benefits from moderately using fossil fuels far outweigh the costs. Yes, the costs are obvious in the "fear, terror, and disaster" we read about in the papers every day.

But the benefits of fossil fuels, though much more prosaic, are nonetheless important. Fossil fuels provide us with low-cost electricity, heat, food, communication, and travel.[15] Electrical air conditioning means that people in the U.S. no longer die in droves during heat waves (Davis, Knappenberger, Michaels, and Novicoff 2003). Cheaper fuels would have avoided a significant number of the 150,000 people that have died in the UK since 2000 due to cold winters.[16]

Because of fossil fuels, food can be grown cheaply, giving us access to fruits and vegetables year round, which has probably reduced cancer rates by at least 25 percent.[17] Cars allow us to commute to city centers for work while living in areas that provide us with space and nature around our homes, whereas communication and cheap flights have given ever more people the opportunity to experience other cultures and forge friendships globally (Schäfer 2006).

In the third world, access to fossil fuels is crucial. About 1.6 billion people don't have access to electricity, which seriously impedes human development (IEA 2004, 338–40). Worldwide, about 2.5 billion people rely on biomass such as wood and waste (including dung) to cook and keep warm (IEA 2006, 419ff). For many Indian women, searching for wood takes about three hours each day, and sometimes they walk more than 10 kilometers a day. All of this causes excessive deforestation (IEA 2006, 428; Kammen 1995; Kelkar 2006). About 1.3 million people—mostly women and children—die each year due to heavy indoor air pollution. A switch from biomass to fossil fuels would dramatically improve 2.5 billion lives; the cost of $1.5 billion annually would be greatly superseded by benefits of about $90 billion.[18] Both for the developed and the developing world, a world without fossil fuels—in the short or medium term—is, again, a lot like reverting back to the middle ages.

This does not mean that we should not talk about how to reduce the impact of traffic and global warming. Most countries have strict regulation on speed limits—if they didn't, fatalities would be much higher. Yet, studies also show that lowering the average speed in Western Europe by just 5 kilometers per hour could reduce fatalities by 25 percent—with about 10,000 fewer people killed each year (WHO, 2002, 72; 2004, 172). Apparently, democracies in Europe are not willing to give up on the extra benefits from faster driving to save 10,000 people.

This is parallel to the debate we are having about global warming. We can realistically talk about $2 or even a $14 CO_2 tax. But suggesting a $140 tax, as Al Gore does, seems to be far outside the envelope. Suggesting a 96 percent carbon reduction for the OECD by 2030 seems a bit like suggesting a 5 mph speed limit in the traffic debate. It is technically doable, but it is very unlikely to happen.

One of the most important issues when it comes to climate change is that we cool our dialogue and consider the arguments for and against different policies. In the heat of a loud and obnoxious debate, facts and reason lose out.

Notes

1. (IPCC, 2007b:10.6.5). Notice that the available report (IPCC 2007a) has a midpoint of 38.5cm.

2. Using (Jevrejeva, Grinsted, Moore, and Holgate 2006), 11.4 inches since 1860.

3. 1996: 38–35cm (IPCC and Houghton, 1996:364), 1992 and 1983 EPA from Yohe and Neumann 1997, 243; 250.

4. (Nicholls and Tol 2006, 1088), estimated for 2085. Notice, low-lying undeveloped coasts in places such as Arctic Russia, Canada and Alaska are expected to be undefended. Notice that the numbers presented are for loss of dryland, whereas up to 18 percent of global wetlands will be lost.

5. "Micronesia" (CIA 2006).

6. Labour has urged a 20 percent CO_2 emission cut from 1990 in 2010 in three election manifestos (BBC Annon., 2006a); this translates into a 14.6 percent reduction from 1997-levels. From 1997 to 2004, CO^2 emissions increased 3.4 percent (EIA, 2006).

7. Take, for instance, both Gore's "we have to find a way to communicate the direness of the situation" and Hansen's "scientists have not done a good job communicating with the public" (Fischer 2006).

8. Developing countries emitted 10.171Gt of the global 26Gt in 2004 (IEA, 2006, 513, 493) (OECD countries 51 percent in 2003 (OECD 2006, 148), Weyant estimates 29 percent from industrialized countries (1998, 2286), IPCC emission scenarios from 23 in the business-as-usual A1 to 36 percent (Nakicenovic and IPCC WG III 2000).

9. Based on a cost of $50 per ton of carbon (Tol 2005:2071).

10. From the Environmental Assessment Institute we asked him in July 2005: "Would you still stick by the conclusion that $15/tC seems justified or would you rather only present an upper limit of the estimate?" He answered: "I'd prefer not to present a central estimate, but if you put a gun to my head I would say $7/tC, the median estimate with a 3 percent pure rate of time preference" ($7/tC = $1.9/$tCO_2$). This is comparable with Pearce's estimate of $1–2.5/$tCO_2$ ($4–9/tC) (2003:369).

11. There are many advantages to taxes over emission caps, mainly that with taxes, authorities have an interest in collecting them (because it funds the government), whereas with caps, individual countries have much less interest in achieving goals with such an effort, because the benefits are dispersed (global) and the damages localized (to local industries).

12. (Akerhielm 1995; Angrist and Lavy 1999; Graddy and Stevens 2005). Of course, this could be modified in many ways, such as by focusing on paying

teachers better, more resources for books, computers, etc. It is also important that we should be saying "more teachers will at least not make schools worse and will likely make them better," as most studies show some or no effect from extra resources but very few show negative results.

13. E.g., (Fleitas et al. 2006; Gebhardt and Norris 2006). On the other hand, it is less clear that (after a certain limit) more doctors and bed space is the answer, since they may just make for more visits and increase the possibility of infections and harm (Weinberger, Oddone, and Henderson 1996; Wennberg et al. 2004).

14. (WHO 2002, 129) puts it second, whereas (WHO 2004, 5) puts it third.

15. This only looks at the marginal benefit of fossil fuels—which is the relevant one for our discussion. On a basic level, though, it is important to remember that they have fundamentally changed our lives. Before fossil fuels, we would spend hours gathering wood, contributing to deforestation and soil erosion—as billions in the third world still do today (Kammen 1995). We have electric washing machines that have cut domestic work dramatically. The historical economist Stanley Lebergott wrote only semi-jokingly: "From 1620 to 1920 the American washing machine was a housewife" (Lebergott 1993, 112). In 1900, a housewife spent seven hours a week laundering, carrying 200 gallons of water into the house and using a scrub board. Today, she spends 84 minutes with much less strain (Robinson and Godbey 1997, 327). We have a fridge that has both given us more spare time and allowed us to avoid rotten food and eat a more healthy diet of fruit and vegetables (Lebergott 1995, 155). By the end of the nineteenth century human labor made up 94 percent of all industrial work in the U.S. Today, it constitutes only 8 percent (Berry, Conkling, Ray, and Berry 1993, 131). If we think for a moment of the energy we use in terms of "servants," each with the same work power as a human being, each person in Western Europe has access to 150 servants, in the U.S. about 300, and even in India each person has 15 servants to help (Craig, Vaughan, and Skinner 1996:103).

16. Steve Jones, "Help the Aged," said: "Many pensioners still agonize about whether or not to heat their homes in the cold weather. In the world's fourth richest country, this is simply shameful" (BBC Annon. 2006b).

17. The World Cancer Research Fund study estimates that increasing the intake of fruit and vegetables from an average of about 250 g/day to 400 g/day would reduce, the overall frequency of cancer by around 23 percent (WCRF 1997:540).

18. Mainly from fewer deaths and less time use.

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Gary Schwartz's Energy Healing Experiments: The Emperor's New Clothes?

Gary Schwartz says his experiments reveal our natural power to heal based on our ability to sense and manipulate human energy fields. Has he discovered scientific truths, or has he only demonstrated the human talent for self-deception?

HARRIET HALL

Gary Schwartz believes many things. He believes in psychics, mediums, and life after death, and he believes there is scientific evidence to support these beliefs. Schwartz is now focusing his powers of belief on a new field: energy medicine. In a new book, *The Energy Healing Experiments: Science Reveals Our Natural Power to Heal*, he explains that we all emit human energy fields, that we can sense each other's fields, and that healers can influence these fields to heal illnesses and injury. He believes these are not just theories but scientifically supported facts.

The book starts with three "gee-whiz" testimonials of supposed energy healing (which are frankly not very convincing and could be easily outdone by any self-respecting purveyor of quack remedies). He goes on to describe experiments done in his own lab that he claims establish not only our ability to detect and alter human energy fields but our ability to detect the thoughts and intentions of others. In the final part of the book, he descends into blethering about quantum physics, the oneness of the universe, the connectedness of all things, and the possibility that energy awareness will solve all of mankind's problems.

He claims to have demonstrated many things. First, he claims to have shown that a subject can sense when a researcher's hand is being held over his or her own hand and can sense when the researcher's hands are being held near his or her ears from behind. Other experiments supposedly show that people can tell when someone is looking at them or thinking about them. He goes on to describe purported measurements of subtle human energy emissions, Reiki influences on lab cultures of bacteria, and photography of biophoton emission from plants, among other phenomena of dubious reality or significance.

He makes a big deal of the fact that humans emit electromagnetic energy (as picked up by EKG, EEG, etc.), and he would like to think energy healers can pick up that energy and decode it in the same way your radio picks up Rush Limbaugh out of the atmosphere. And then he would like to think that energy healers can send something back into the patient's body to enable healing. He misses the crucial fact that there is information encoded in the electromagnetic waves your radio detects, but there is no reason to think there is any analogous information coming from the body, much less any way to change that information and send it back to produce healing. I only wish we *could* use "energy healing" on radio and TV waves to improve the quality of programming!

He makes a big deal of the fact that everything affects every-

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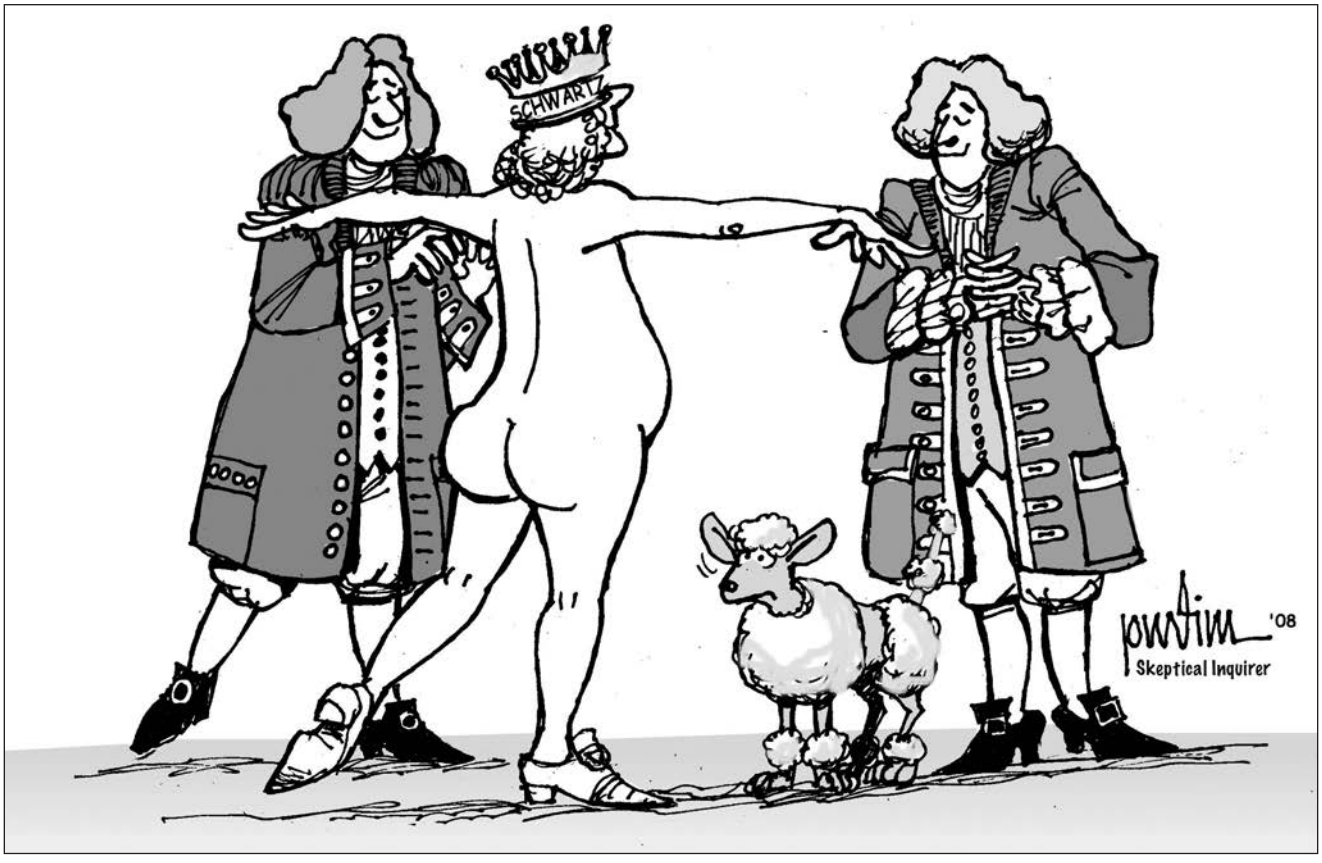

thing else. He seems to mean this in a holistic, metaphysical, New Age, "the universe is one and is conscious and we can create our own reality" sense. Science recognizes that small events can have far-reaching effects, but that doesn't mean one thing can predict or control another. The flap of a butterfly's wings may set up initial atmospheric conditions that will result in a tornado somewhere else, but that doesn't mean you can predict the tornado or deliberately use a butterfly to cause one. Theoretically, a change in the magnitude or position of your body mass will enter into the overall gravity equations of the universe, but that doesn't mean one thing can control or predict another. You could hardly expect to meaningfully influence someone out there beyond Alpha Centauri by losing ten pounds or moving to Antarctica. You can't expect to change the EEG of an astronaut in the Space Station by exercising to change your own EKG. We are talking about *very* small influences. If a gnat pushes an elephant, it's not likely to fall over; it's not likely to even notice. And then there are inconvenient complications like quantum theory and chaos theory.

The only thing of substance in the book is the experiments, which lose credibility because they were not accepted for publication in mainstream peer-reviewed journals. Schwartz claims this is because of politics. He says prestigious journals tend to reject positive-energy studies. He doesn't believe that his studies could have been rejected because they didn't meet the standards of good science. I feel sorry for him: he's a smart guy, he means well, he really believes he has found something wonderful, but he has a blind spot and just *doesn't get it* when others try to point out the flaws in his experimental methods and reasoning. (See Ray Hyman, "How Not to Test Mediums: Critiquing the Afterlife Experiments," SKEPTICAL INQUIRER, January/February 2003, and the follow-up exchange between Schwartz and Hyman, May/June 2003, plus the critical letters to the editor in that issue.)

To put the accusation of "politics" into perspective, consider the *Helicobacter* experiments. When researchers first suggested that ulcers might be caused by bacteria, they were laughed at. They published their results, peer review had a field day, other labs looked into the idea, more data came in, results from various lines of research coalesced, and within a mere ten years it became standard practice to treat ulcers with antibiotics. It didn't matter that the idea sounded crazy at first; science responded to good evidence. (See Kimball C. Atwood IV, "Bacteria, Ulcers, and Ostracism," SKEPTICAL INQUIRER, November/December 2004.) If Schwartz had evidence of equal quality, he would get an equal hearing by the scientific community.

Sure, Schwartz has some data that he finds convincing. So did the discoverers of N-rays, polywater, and cold fusion. Good science demands that we withhold judgment until data can be replicated in other labs and validated by other methods—especially when the data come from a researcher as clearly prejudiced as Schwartz. Even the best researchers can fall prey to errors of unconscious bias and unrecognized pitfalls in experimental design.

A good scientist considers *the entire body* of available evidence, not just the claims of one group of researchers. Schwartz only describes experiments that support his beliefs. Not until the end of the book does he even bring up the fact that other experiments have directly contradicted his findings. He finally gets around to mentioning Emily Rosa's landmark experiment, published in the *Journal of the American Medical Association* in 1998, which showed that therapeutic touch practitioners could not sense human energy fields as they claimed. She tested twenty-one experienced practitioners of therapeutic touch.[1] They all thought they could detect Rosa's human energy field and feel whether she was holding her hand over their right or left hand, but when they were prevented from *seeing* where her hand was, their performance was no better than chance.

Sure, Schwartz has some data that he finds convincing. So did the discoverers of N-rays, polywater, and cold fusion. Good science demands that we withhold judgment until data can be replicated in other labs and validated by other methods.

Rosa was nine years old at the time, and the article grew out of her school science fair project. The experiment was beautiful in its simplicity. Adult true believers had published much research on the techniques and effects of therapeutic touch, but in the true spirit of childlike questioning, Rosa went back to basics and asked the crucial question: "Is the phenomenon itself real? Can they really feel something or is it possible they are fooling themselves?" Amazingly, no researcher had ever asked that question before. They had ignored one of the basic principles of the scientific method as explained by Karl Popper: it's easy to find confirmation for any hypothesis, but every genuine test of a hypothesis is an attempt to falsify it.

Schwartz dismisses her experiment as having five "potential problems":

(1) It was a science-fair project done by a young girl.

(2) She was the only experimenter.

(3) She randomized by flipping a coin, which he calls "an unreliable procedure."

(4) One of the authors was the founder of Quackwatch.

(5) The subjects did *worse* than chance.

These objections are just silly; they are either inaccurate or are *ad hominem* attacks:

(1) It shouldn't make any difference whether Rosa was a young girl or an old man or a sentient purple octopus from an alien planet. It shouldn't matter whether she did the experiment for an elementary school project, a doctoral dissertation, a Coca Cola commercial, or a government grant. What matters is the quality of the evidence. In this case, her project was well

designed and executed, had clearly significant findings, and was of high enough quality to be approved for publication in a prestigious peer-reviewed medical journal.

(2) She was not the only experimenter. Others were involved; the experiment was repeated under expert supervision on *Scientific American Frontiers.* This should preclude any accusations of deliberate cheating or inadvertent failure to follow the protocol properly. Rosa was the only one to carry out the trials, but what would multiple testers have added to the experiment? The results didn't depend on any special ability or quality of hers, but on the ability of the subjects who claimed they could sense anyone's energy fields. For the televised trials, they even got to "feel" the "energy" from each of Rosa's hands and choose which one they wanted her to use in the trials. About half chose her left hand and half her right. No one objected, "I can't feel energy from either hand."

(3) Flipping a coin is not an "unreliable procedure"—unless the flipper is deliberately cheating. I hope Schwartz didn't intend to suggest that. The number of heads and tails was approximately equal, and the distribution appeared random. The editors of *JAMA* found the method acceptable. There are situations where coin-flipping could legitimately be criticized, for instance in psi experiments where researchers are looking for minuscule differences in large bodies of data and even their computerized random number generators have been criticized for not being "perfectly" random. But in this experiment, the results were clearly significant; it is hard to envision how a different method of randomization could have altered the results. The coin flip was only used to determine which of the subject's hands she would hold her hand over. The subjects claimed to be able to sense energy fields with either hand, so it shouldn't have made a bit of difference to their perception. Faulty randomization might have allowed the subjects to perceive a pattern and guess, which would have tended to give false positive results rather than the negative results Rosa got.

(4) One of the authors, the founder of Quackwatch, was admittedly skeptical of therapeutic touch. Yes, someone with possible bias was *indirectly* involved in the experiment. If that is an objection, there is an even greater objection to Schwartz's own experiments: he and his colleagues are all strongly biased toward belief in energy phenomena and they were *directly* involved in their experiments.

(5) It is simply not true that the subjects did "worse than chance." Their performance was consistent with chance. If they *had* done worse than chance (significantly worse) that would have tended to support Schwartz's claim that some kind of effect was present, even though it would have been the reverse of what he claimed to find.

In my opinion, none of these "problems" invalidates the conclusion that the therapeutic touch practitioners failed to do what they claimed they could do. And if he thinks these were valid problems, why didn't he simply repeat her experiment in his own lab with multiple experimenters and a more reliable method of randomization? He could have published a failed replication study, and the scientific community could have proceeded to evaluate both studies and sort out the truth. In reality, Rosa's experiment was a great example of a young child being able to see more clearly than prejudiced adults—a real "Emperor's New Clothes" story.

I see a lot of "potential problems" in Schwartz's research—not just *ad hominem* problems but flaws of experimental design. To start with his most basic experiment: his subjects were blindfolded, sat facing the experimenter with their hands on their laps, and tried to detect which hand the experimenter was holding his hand over. The experimenter held his hands together between trials to keep his hand temperature constant. The subjects often didn't think they could tell, but they were asked to guess, and their guesses were statistically significant.

The first problem is that blindfolds don't work. Rosa knew this. Instead, she had her subjects put their arms through holes in a screen and covered the gaps with a towel to preclude any possibility of conscious or unconscious visual cues. She also had subjects lay their arms on a table instead of on their laps, thus reducing the chance of their detecting subtle clues from the person sitting in front of them. Another problem is that when the researcher holds his hands together, that raises the skin temperature and raises the possibility that heat is being detected rather than any other type of energy. And if Schwartz's results are real, independent researchers should be able to replicate them using the same protocol. Apparently they have not been replicated elsewhere. In fact, Rosa's experiment amounts to an independent attempt to replicate Schwartz's basic experiment, only with better controls; and it failed to confirm his results.

If a rigorous scientist thought he had found evidence that people could detect "human energy fields," he would maintain a healthy skepticism; he would immediately try to prove himself wrong, and he would enlist his colleagues to help show him where he might have gone wrong. He would try to rule out all other possible explanations (the subject might be sensing heat, sound, motion, air currents, might be able to see under the blindfold, etc.). If the phenomenon proved robust, he would try to refine his understanding by doing things like varying the distance to see if it obeyed the inverse square law and interposing a sheet of cardboard or glass to see if the effect could be blocked. Then he would try to use instruments to measure what kind of energy was being sensed.

When a believer thinks he has found something to justify his belief, his approach tends to be less rigorous. Instead of subjecting his original experiment to outside scrutiny, he tends to do more new experiments to try to convince others that he is right. Schwartz goes off on a tangent doing other experiments that purportedly show that the subject is not sensing the energy field but is actually sensing the conscious intention of the experimenter. In one, he claims to show that persons can tell whether someone standing behind them is staring at their head or at their back! If he really believed energy medicine was some kind of psychic thought transmission, he would concentrate on that route of research, but instead he keeps trying to document the ability to detect measurable physical energy fields. His thinking is confused, and he's trying to eat his cake and have it too.

Schwartz's style of reasoning was revealed when an experiment to influence *E. coli* bacteria with Reiki didn't produce the desired results. Instead of accepting that it didn't work, he tried to find a way to make the experiment look like it worked. He

did some inappropriate "data mining" and tried to show that before the trials where the Reiki practitioners apparently failed, they had been under more stress than before the trials where they apparently succeeded.

He finds a gifted individual who can detect whether a wooden box has a rock in it or not—his success rate is 95 percent for natural crystals, although barely chance for manmade crystals. Unfortunately, before this individual can be tested properly in an independent lab, he develops medical problems and loses his ability. (It's strange how often these inconvenient things happen when psychic claims are involved.)

Schwartz is mystified by the work of John of God, the Brazilian spiritual healer who performs bloodless, painless surgery. He doesn't recognize that this charlatan is merely using old gimmicks from the carnival sideshow repertoire to fool the gullible. Schwartz also believes science has established that the human mind can change the pH of water over long distances. He is far less skeptical about such claims than the average scientist.

Schwartz has tried to bolster his credibility by getting a former Surgeon General's endorsement. In Richard Carmona's foreword, he says he has seen things he can't easily explain and says we don't have all the answers. He helped establish the National Center for Complementary and Alternative Medicine (NCCAM, which he curiously refers to as the National Center for Alternative and Complementary Medicine). The purpose of the NCCAM was allegedly to test complementary and alternative medicine (CAM) and find out which treatments worked and reject those that didn't. But in its entire history, despite consistently negative results, it has never dared to reject anything. Carmona is currently CEO of Canyon Ranch Health, where Schwartz is the Director of Development of Energy Healing. Canyon Ranch offers integrative medical wellness services, including therapeutic touch. Carmona says, "Where the science supports these integrative concepts of energy medicine, let's use them. Where there is not enough science, let the studies begin and continue."

What about "if there is no convincing science or plausible mechanism to support them, let's stop wasting our time chasing moonbeams"? All of energy medicine hinges on one basic claim: that people can detect subtle human energy fields. If Schwartz is wrong about that, the rest of the claims for so-called "energy medicine" fizzle away.

Since 1996, the James Randi Educational Foundation (JREF) has offered a substantial reward (currently $1,000,000) to anyone who can demonstrate an ability to detect a "human energy field" under conditions similar to those of Rosa's study. Of the more than 80,000 American therapeutic touch practitioners who claim to have such ability, only one person attempted to demonstrate it. She failed. The JREF challenge is admittedly not a definitive scientific test, but prudence would seem to dictate that if no one can even meet this simple challenge, we shouldn't be wasting research money on what is probably a myth.

Others have attempted to establish the "science" of energy medicine and have failed.[2] Even the NCCAM, which is willing to consider almost any possibility in alternative medicine, is skeptical. It distinguishes between real energy (sound waves, electromagnetism, and other energies measurable by physicists) and the kind of "putative" energy Schwartz is trying to validate. It concludes that the "putative" energy approaches "are among the most controversial of CAM practices because neither the external energy fields nor their therapeutic effects have been demonstrated convincingly by any biophysical means."[3]

Schwartz sounds like a scientist. He tries to talk the talk and walk the walk. He even makes some skeptical noises to try to convince us he is objective. But there is also a lot of very unscientific language in his book. For instance:

> Human rage and pain, especially generated by terrorism and war, create a global energetic climate whose negative effects can extend from the physical and environmental—potentially including climate—to the psychological and ultimately spiritual. . . . [P]ollution is not simply chemical, it is ultimately energy based and therefore conscious as well.

Adult true believers had published much research on the techniques and effects of therapeutic touch, but in the true spirit of childlike questioning, [Emily] Rosa went back to basics and asked the crucial question: 'Is the phenomenon itself real?'

Really? Conscious pollution? So maybe if we talk nice to pollution it will cooperate and go away? Or should we try doing Reiki to lower the atmospheric CO_2 levels? Does Al Gore know about this?

"Energy medicine" is an emperor whose new clothes still look awfully transparent to critical thinkers and to the scientific community no matter what glorious colors and fabrics Schwartz and his colleagues imagine they are seeing.

Notes

1. "Therapeutic touch" is a bit of a misnomer because these practitioners don't actually touch but simply massage the air a few inches from the patient's body. They are convinced that they are detecting and manipulating the energy field, balancing and smoothing it, and correcting any abnormalities, thus allowing the body to heal itself.

2. Hall, H. 2005. A review of *Energy Medicine: The Scientific Basis. Skeptic* 11(3): 89–93. Available at http://quackfiles.blogspot.com/2006/01/review-of-energy-medicine-scientific.html.

3. http://nccam.nih.gov/health/backgrounds/energymed.htm.

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Ten Million Marriages

An Astrological Detective Story

The largest test of astrology ever undertaken shows that love has nothing to do with the stars—even though patterns in the data can be misleading.

DAVID VOAS

Millions of people apparently believe that the success or failure of their relationships can be explained, at least in part, by astrology. An Internet search on Google for "love" and "astrology" produces 350 thousand hits. According to her agent, the books by the late Linda Goodman—including *Sun Signs* and *Love Signs*—have sold more than one hundred million copies worldwide in the past forty years. When it comes to love, people will evidently try anything.

It occurred to me that the census of population offers an unusual opportunity to test the claim that people of different signs have varying degrees of compatibility. In the largest test of astrology ever undertaken, I analyzed the birthdays of all the husbands and wives in England and Wales—a total of more than ten million couples. Even the smallest tendency for Virgos to fancy Capricorns or for Libras to like Leos would be apparent in the statistics. If only one pair in a thousand is influenced by the stars, we would see ten thousand more couples than expected with certain combinations of signs. In fact, the numbers are just what we'd predict based on chance.

Few readers of SKEPTICAL INQUIRER are likely to be surprised by this result, but the story attracted interest from around the world, and for several days I gave radio interviews on stations from Australia to Hungary and from Brazil to Canada. The genuinely intriguing part of the story went largely unreported, though, partly because it is complicated and partly because journalists see it as unexciting. It concerns the widespread desire to find support for pseudoscience and the much harder work involved in uncovering the real explanations.

The Mysterious Attraction

A census of population is carried out every ten years in England and Wales by the Office for National Statistics (ONS), most recently in 2001. The census is an invaluable resource: it aims to cover 100 percent of the population, and participation is legally required. Post-census surveys and quality checks provide information about nonresponse and response error.

The census records the birthdays of all husbands and wives living together in England and Wales, a total of more than twenty million people. Although age is a common variable in social statistics, specific months and days of birth do not feature in the standard tables published by the ONS. You can, though, commission special tables including any of the data collected, subject to the usual considerations of data protection. Once a table has been created it becomes publicly available.

One day when looking through the list of commissioned tables, I noticed that someone had requested a cross-tabulation of the star signs of husbands and wives. I was amused, but it did seem an excellent way of testing the "love signs" hypothesis. After all, people born during the month-long periods defined by a particular sign are supposed to share certain dispositions, for example, generosity, sensitivity, or stubbornness. These tendencies affect personal relationships, and according to common astrological belief, people of different signs have varying degrees of compatibility. Although plenty of married couples are mismatched and marriage may be based on factors other than love or long-term suitability, there is presumably *some* tendency for people who have married (and then stayed married for ten, twenty, or more years) to be more compatible than individuals chosen at random.

I assumed that the table would show no association between the signs for husbands and wives. My original intention was simply to run a statistical test and then announce the result, thereby providing fifteen minutes of entertainment. In fact, the project would occupy my spare time for several weeks.

The reason is that the spousal star sign table showed a very small but significant tendency for people to marry partners of the same sign. A slight "spillover'" effect was also detectable, with some apparent affinity between neighboring signs, especially where the wife's sign immediately followed the husband's. These are not the principal kinds of attraction that would have been predicted by astrologers. Nevertheless, the table implied the existence of about 22,100 more same-sign couples than would have been expected by chance, or an excess of about 26,900 if adjacent signs are included. This figure is still only a quarter of one percent of the total number of married couples, but it is large enough to present a puzzle worth investigating.

I contacted the person who had requested the table to ask him what he made of the finding. He described himself as "a philosopher with a degree in statistics" who was "investigating the truth behind astrology." He conceded that the same-sign association might arise if people deliberately chose partners with whom they had things in common (including star sign) but asserted that close analysis revealed "subtler, scientifically reliable patterns that do strongly imply an astrological effect." Unfortunately, he was unwilling to show me this supposed evidence unless I provided a written undertaking (signed by the head of my research centre!) not to publish any work on the data before he did.

Although not pleased by the implication that I might be an intellectual property bandit, I was more affronted by the uncritical readiness to find mini-miracles in these statistics. All forms of survey data are affected by various problems (including nonresponse, response error, coding error, imputation bias, and so on) that might produce curious artifacts in the results. We need to think about these issues before jumping to surprising conclusions. Furthermore, by looking only at data on star signs, we have no way of knowing whether other groupings of birthdays would produce patterns that are just as strong (which would mean there is nothing specifically "astrological" about the anomaly).

I therefore commissioned a table providing a full breakdown of husbands and wives by day and month of birth. I specified

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husband's age as a third variable to see whether the effect was a generational phenomenon and to provide distinct subsamples if needed. The result was a table containing counts for nearly 670,000 combinations of birthdays (366 days 3 366 days, for all married couples plus four age subsets). In addition, I asked the ONS for details of the procedure followed when a date of birth was indecipherable or not recorded.

Devising a Test

I should pause here to fill in some background. Astrologers maintain that our lives and characters are influenced by the configuration of the solar system at the time we were born. A complete horoscope, or natal chart, includes information about where the sun, moon, and planets are observed relative to each other and the constellations of the zodiac at the time and place of the subject's birth. Popular astrology in the West focuses on one key element in this chart: the "sun sign" (or "star sign" in colloquial parlance), which is determined by the position of the earth in its annual revolution around the sun.

I proposed to test the lowest common denominator of astrological belief: the claim that sun signs make a difference to individuals and hence, to couples. Unfortunately, there is no consensus among astrologers, and a survey of books and Web sites reveals a considerable variety of views concerning propitious pairings. I therefore set out to look for evidence that *any* combination of signs is found more or less often than would be expected to occur by chance. Although the scientific aim is to investigate any effect however small, for practical purposes astrology would be of little interest unless the influence of the heavens is appreciable. When people discuss popular astrology, they presumably suppose that astral compatibility will affect a substantial proportion of matches.

We need to recognize three factors that may affect the results. The first is the operation of chance. In every hand of cards, the balance between suits will usually be uneven. The larger the number of cards dealt, the smaller the relative discrepancies, but some variation is inevitable. Second, and even more important, we can never measure anything with perfect precision and total accuracy. Date of birth is one of the most basic pieces of personal information, but it may not be recorded correctly. Some people do not know their birthdays. A person completing a form on behalf of somebody else may not know when he or she was born. People make mistakes, especially when providing multiple dates. Handwriting can be hard to decipher. Some people will decline to respond; others lie. It is possible through careful checks to estimate the extent of these errors, but we need to remember their existence when trying to measure small deviations from an expected value.

Finally, some combinations of signs may occur more frequently than expected if a substantial number of people seek these matches and avoid others. If even a modest number of people choose partners at least partly with signs in mind, then some patterns may appear. One would then have the task of trying to distinguish these effects from genuine astrological ones, for example, by including only people who do not have relevant astrological knowledge or beliefs.

Analysis

On the face of it, sun sign seemed to have a very small but noticeable effect. Couples were slightly more likely than expected to share the same sign or, to a lesser extent, have adjacent signs. The question was whether this was a genuine causal relationship or some sort of artifact.

When I received the table I had commissioned, I immediately aggregated the days of birth by month. The "month effect" was slightly larger than the "sign effect" observed initially: there are about 23,450 more spouses with the same month of birth than expected.

I soon realized that the apparent tendency to choose partners of the same sign or month of birth is actually explained in large part by matching *days* of birth. The number of couples for whom the same birthday was recorded for husband and wife is 41% higher than expected (about 39,800 rather than 28,300). Now while there may be some people who are drawn to each other because they share a birthday, the excess probably reflects response error for the most part. Census forms are typically completed by one member of the household, and that individual may—through carelessness or forgetfulness—write in his or her birthday when entering details for the spouse. Evidence that precisely this type of error occurred comes from the data validation study conducted by the ONS on what appeared to be same-sex partnerships. For around 10,900 couples, one person apparently assigned his or her own sex to the partner. If people can make mistakes about their spouse's sex, it is hardly surprising to find corresponding problems with birthdays.

The most commonly recorded birthday is January 1st (2,560 rather than the 77 one would expect from random assignment), with July 1st in second place. It seems likely that many people entered the first day of the year if an exact birthday was not known. (In personal communication, a member of ONS staff reported seeing some forms from old people's homes where that had been done systematically, and it also seemed to occur more frequently with people not born in the U.K.)

In addition to the approximately 11,500 couples in excess of the number expected who recorded sharing the same birthday, many listed the same day (but not month) of birth or the same month (but not day). Where husbands and wives are recorded as having the same birthdays or the same day of birth in different months, response error is the natural explanation of higher than expected counts. Where only the same month is recorded, it again seems probable that mistakes will contribute to the excess, but we cannot rule out some kind of seasonal affinity. The question is whether this connection could be astrological.

The partial overlap between astrological signs and months of birth allows a critical experiment. Each sign starts in one month and ends in the next, so that the first third of Aries, for example, falls at the end of March with the balance being in April. Consider people born between March 23rd and 30th: are they more likely to be married to someone whose birthday falls during March 2–20, or April 2–20? In one case the spouse would have the same month of birth but a different sign, while in the other the spouse would have the same sign but a different month of birth. If the first situation is more frequent then, by accident or

design, month is more important. If the other is more common, then it would appear that sign really does make a difference (if only by choice).

The results were clear. The couples whose birthdays belonged to the same sign but fell in different months were not significantly more numerous than chance would allow. By contrast, there were more combinations of birthdays from different parts of the same month than expected. This excess in shared months of birth is probably the result of response error, but in any event sun sign is not a factor.

It only remains to explain the higher than expected counts for neighboring months (or signs). We know from the ONS that 0.5 percent of census respondents supplied illegible dates of birth or none at all. In these cases, dates of birth were entered using an automated system of "imputation" early in the course of data processing. All days were imputed as the first of the month, and the months were assigned in rotation. Thus, if the dates of birth for both husband and wife needed to be filled in, one would be given the first of month *m* and the other the first of month *m*+1 (assuming one partner followed the other on the census form). Because husbands are typically listed before wives on the form, most cases of double imputation will assign women to the month following their spouses. This sex-linked effect is exactly what we observe.

We can take steps to remove these response artifacts from the raw data. First, couples where one or both spouses were recorded as born on the first of the month are excluded. Next, the counts are adjusted to correct for the tendency of some respondents to supply the same birthday or month of birth for their spouses. The outcome is a scatter of low deviations, essentially what one would expect to occur by chance.

Conclusion

The research showed that astrological sign has no impact on the probability of marrying—and staying married to—someone of any other sign. For decades, popular astrologers have promoted the idea of "love signs": compatibility between partners with certain combinations of birthdays. If the more than twenty million married people in England and Wales offer any indication, however, lonely hearts who worry about the zodiac are wasting their time. After making allowances for response error and imputation, the distribution of spousal birthdays is what one would expect from a random distribution.

Astrologers have responded to these findings in various ways. One common comment is that marriage is no proof of compatibility. Indeed it is not, but all that this test requires is *some* tendency for compatible couples to marry and to stay married and for incompatible ones to avoid each other or separate. I do not need to assume that all marriages are based on astrological compatibility, only that some of them are. If even one in a thousand were influenced by the stars, it would be detectable in a sample this large.

The astrologers' main line of defense is that the sun sign on its own is far too crude a measure to allow any predictions of personality and romantic suitability. This concession wrecks popular astrology, which is based almost solely on sun signs, but it fails to protect full natal chart astrology. If sun signs have any influence, however small and however complicated by the positions of the other celestial bodies, the giant magnifying glass of this huge sample would reveal it. No effects were found.

This point deserves elaboration. In responding to my findings, professional astrologers assert that sun signs are less important to relationships than the moon, or Mars and Venus, or some other features of the full horoscope, or all in combination. (In the course of many interviews, I was presented with various competing stories about which elements of the chart matter most.) These claims are beside the point. By way of analogy, social scientists maintain that a father's occupation has an influence on the life chances and future socioeconomic status of his offspring. Such a statement is wholly consistent with many other factors (education, ability, ambition, luck, etc.) being even more important, or with the irrelevance of this factor to some or even most of the population. It does imply, though, that we will be able to detect this influence using appropriate statistical tests on a sufficiently large sample, as indeed we can. Likewise, it does not matter that sun sign is only one astrological factor among many: if it has any influence at all, then a sample of ten million should be sufficient to confirm it.

A more sophisticated version of the astrologers' argument is that no aspect of the chart is meaningful in isolation, and that only interactions between sun signs and other features of the full natal chart have any significance. Even this claim—that there are no direct effects, in statistical terminology—does not work. It is true that we would find it difficult to measure the influence of sun signs if they sometimes had one effect and sometimes another. In a very large sample, however, we could at least verify that they had on average *some* impact, even if we could not specify it accurately. The only way that sun signs could be significant but wholly invisible would be if, for example, some Sagittarians had certain characteristics and exactly as many had opposite ones. Such a perfect outcome is implausible and would furthermore mean that no generalizations about sun signs could be true. Virtually all astrologers, however, make statements about the supposed influence of different elements of a chart, including the sun sign. Any tendency in favor of one trait rather than another would be detectable in a large sample.

It does not appear that any of the ten million married couples in England and Wales were brought together by "love signs." Skeptics will not be surprised by this lack of evidence for astrology. What may be unexpected, though, is the implication that even astrological *belief* has no apparent influence on partner choice. The pervasiveness of the zodiac in popular culture might have induced some people to favor certain signs over others in considering possible mates. If enough people believed that signs matter and were prepared to act on those beliefs, then some combinations would appear more often than expected even if they had no bearing on compatibility. The fact that we see no such effects suggests that the number of true believers must be very small (unless the advice they read is random). In the final analysis, whether we fall in love seems to have nothing to do with the stars or even what we might suppose they tell us. □

GUIDE FOR AUTHORS

The SKEPTICAL INQUIRER encourages the scientific outlook, science and scientific inquiry, critical thinking, and the use of reason and the methods of science in examining important issues. While we are known for our critical examinations of claims of paranormal, fringe science, and pseudoscientific phenomena, we have broadened our scope to include scientific or investigative examinations of a wide variety of public issues. Issues of broad public importance are of potential interest as long as they involve science and reason. Our subtitle, "The Magazine for Science and Reason," accurately conveys our focus and outlook.

Well-written articles, reviews, and columns from leaders in science, biomedicine, psychology, the social sciences, philosophy, education, and technology are sought. Contributions by investigative journalists and science writers are also wanted.

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Space is at a premium. Many accepted articles await publication space, and many submitted articles cannot be published. Articles are typically 1,800 to 3,200 words (about 8 to 12 double-spaced pages in a standard 12 pt. font). Longer manuscripts will be returned. Articles should be organized around one central point or theme and be succinct.

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We publish reviews of new or recently published books. You may query the editor first to ensure interest and to avoid duplication. Most book reviews are about 600 to 1,000 words. Include publication data at the top of the review in this order: Title. Author. Publisher, City. Year. ISBN. Number of pages. Hardcover or softcover, price. Include a suggested reviewer bio note at the end.

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News articles from 250 to 1,000 words are welcome. They should involve timely events and issues and be written in an interpretative journalistic style. Use third person. The news sections of *Nature, Science, New Scientist*, and *Science News* are excellent models. Balance, fairness, and perspective are important. In reporting on controversies, seek and include comment and perspective from the various opposing parties.

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These are invited commentaries by noted experts about urgent, topical issues of broad public importance. Length is about 1,200 words. Most are invited, but queries from well-known authorities and authors are welcome.

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The Follow-Up column is for response from persons whose work or claims have been criticized in previous articles. The original authors may respond in the same or a later issue.

Letters to the Editor

Letters to the Editor are for views on matters raised in previous issues. Letters should be no more than 225 words. Due to the volume of letters received, they cannot be acknowledged, and not all can be published. Those selected may be edited for space and clarity. Authors criticized in the letters column may be given the opportunity to respond in the same issue. Submit letters to the editor by e-mail to letters@csicop.org.

FORMAT REQUIREMENTS

Text

Manuscripts submitted by mail should be printed out double-spaced, including notes and references, on 8-1/2"x11" white copy paper with one-inch margins on all sides. In electronic manuscripts as well as paper versions, indent the first line of all paragraphs and do not add an extra line space between paragraphs.

Number all pages in sequence, including those for references, figures, and captions. For mailed Articles, submit an original and two photocopies (for reviewers); for other categories, an original and one photocopy.

Almost all final material is now required in electronic form. If you mail your manuscript, include the full text including article cover page on a CD, DVD, or floppy disk, or be prepared to send upon acceptance. Alternatively, manuscripts that are invited or expected (query the editor for interest) may be e-mailed as an attachment to the editor (or to an assistant editor if so requested). Photos and artwork should be in electronic form as well.

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References must be formatted according to the author-date system of documentation as found in *The Chicago Manual of Style* (15th ed., especially Secs. 16.4 and 16.90-120). Sources are cited in the text, usually in parentheses, by author's last name and year of publication (with no comma between). Examples: (Smith and Jones 2008). Or (Smith and Jones 2008, 37) to add the page number. (Sanders et al. 2008) for more than three authors. Multiple: (Watkins 2008, 2007; Foley and Masterson 2004; Hsu 2006) These text citations are amplified at the end of the manuscript in a list of References (alphabetized by last name of first author), which give full bibliographic information in the style shown below. Second and subsequent authors' names are in natural (not inverted) order. Pay particular attention to the details of punctuation. No ampersands. No parentheses around the year of publication. No punctuation after journal names. Colon and space between volume (issue number) and page numbers. Give full names of journals (not abbreviations). In titles of printed works, capitalize only first word, first word after a subtitle, and proper nouns. For works without authors, start with title, not "anonymous." Check recent issues for other examples. Manuscripts with references in other styles will be returned for revision.

Sample book entry:

Smith, John, Jane Jones, and J.T. Thompson. 2008. *A Skeptical Book*. New York: Jones Press.

Sample journal article entries:

Smith, John, Jane Jones, and J.T. Thompson. 2008. A skeptical article. *The Journal of Studies in Science and Skepticism* 5 (1): 7–12.

Carlson, J.T., W. Shimizu, and E. Tyler. 2008. Title of Article. *New England Journal of Medicine* 356 (14): 933–944.

Institutional Author, Web Site:

Institute of Medicine. 2004. Immunization Safety Review: Vaccines and Autism. May 17. Available at www.iom.edu/CMS/3793/4705/20115.aspx.

Use numerical *end*notes (not footnotes), labeled "Notes," for explaining or amplifying discussions in the text. Notes should be minimized. If these Notes contain citations, the citations should be in author-date style.

Illustrations

Figures and graphs should be submitted electronically in high resolution (at least 300 dpi) as JPEG files. Assign each illustration with a Figure number and supply captions on a separate page.

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The Strange Case of Frank Jennings Tipler

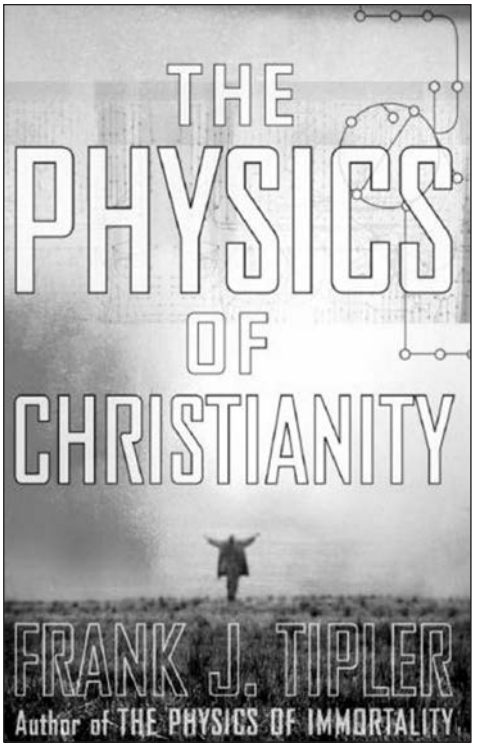
MARTIN GARDNER

The Physics of Christianity. By Frank Tipler. Doubleday, New York, 2007.
ISBN: 0385514247. 336 pp. Hardcover, $27.50.

The Physics of Christianity by Frank Tipler, a mathematical physicist at Tulane University, is a sequel to *The Physics of Immortality*, a bestseller in Germany before it was published here in 1994 by Doubleday. In that book, Tipler argued that anyone who understands modern physics will be compelled to believe that at a far-off future date, which Tipler calls the Omega Point (borrowing the term from the Jesuit paleontologist Tielhard de Chardin), God will resurrect every person who lived, as well as every person who could have lived! Our brains will be preserved as computer simulations and given new spiritual bodies to live happily forever in the paradise described in the New Testament.

In his new book, published in 2007 by Doubleday, Tipler goes far beyond his previous one. He claims that modern physics also provides reasonable explanations for the historical accuracy of all the central miracles of Christian faith, as well as the many alleged miracles that continue to take place, notably those associated with Catholic saints. "From the perspective of the latest physical theories," Tipler writes in his introduction, "Christianity is not a mere religion but an experimentally testable science." Roll over, Mary Baker Eddy!

It is no surprise that Tipler has become a conservative, orthodox Catholic. On page 217 he attributes



his conversion to the influence of the German Lutheran theologian Wolfhart Pannenberg.[1] "[He] spent fifteen years in a finally successful attempt to persuade an American physicist (me) that Christianity, undiluted Chalcedonian Christianity, might in fact be true and might even be proved to be true by science."

There are two ways, Tipler writes, to regard miracles:

1. They are, as David Hume famously maintained, supernatural events that violate laws of science.

2. They are highly improbable events performed by God, but without violating any natural laws.

The second view is the heart of Tipler's new book.

One can think of Tipler as a Christian version of Immanuel Velikovsky. A devout orthodox Jew, Velikovsky explained the great miracles of the Old Testament by invoking the laws of physics (see "Creationism, Catastrophism, and Velikovsky," SI January/February 2008). Thus, Joshua was able to make the sun and moon stand still in the sky because a giant comet erupted from Jupiter and passed close to Earth causing it momentarily to stop rotating. It also caused the Red Sea to part precisely at the moment Moses commanded it. The comet showered edible manna on Israel before it settled down to become Venus.

Velikovsky had no interest in New Testament miracles, unlike Tipler who is concerned with New Testament miracles but is silent on Old Testament ones. It would be interesting to know what he thinks about the dreadful fate of Lot's wife or the agony of Jonah in the belly of a whale. Tipler has a natural explanation

Martin Gardner's latest book is The Jinn From Hyperspace, *a collection of essays, reviews, and fiction, published in 2007 by Prometheus Books.*

for every miracle of Christianity, including those not in the Bible but infallibly validated by the Roman Church. All are caused by God, though "never ever" by abrogating any law of physics.

Tipler devotes chapter six to the Star of Bethlehem. The accuracy of Matthew's account is never questioned. The star was not a supernatural event, nor was it a conjunction of Jupiter and Saturn as some Bible commentators surmise. It was, Tipler assures us, a supernova bursting in the galaxy of Andromeda. God cleverly timed the nova so it would signal the birth in Bethlehem of his only begotten son.

Chapter seven reveals for the first time the dark secret of the Virgin Birth. It was a rare case of parthenogenesis! This is the technical term for births that lack male fertilization of a female egg. The phenomenon is fairly common among certain vertebrates such as snakes, lizards, and turkeys; Tipler sees no reason why it can't occur in humans, and he suspects it actually does occur. He is convinced this happened with Mary. Moreover, he thinks Mary's parthenogenesis could be confirmed by careful analysis of Jesus's blood on the Shroud of Turin!

Tipler has no doubts about the genuineness of the Shroud. Two microphotographs of the blood are introduced, and Tipler claims that its DNA is consistent with Mary's virginity. True, the Holy Spirit played a mysterious role in the Virgin Birth, but the birth broke no biological laws. The Bible, Tipler reminds us, implies that Joseph did not believe his young wife when she denied that any man was involved in her being with child.

All conservative Christians believe Jesus was free of the original sin that resulted from the Fall, which has been passed on to all descendants of Adam and Eve. Catholics think that Mary, too, escaped original sin. (It is a Catholic heresy to reject the Immaculate Conception.) How does Tipler explain the way Jesus and Mary differ in this manner from all other humans?

Tipler's answer is wonderful. There must be genes that carry original sin! This could be verified some day, he writes, by first identifying the gene. Thus, failing to find evidence of the gene on the Shroud of Turin would explain the sinlessness of both Jesus and his mother.

(I am, dear reader, doing my best to keep a straight face while I summarize Tipler's convictions.)

Chapter seven is about Jesus's resurrection. Here Tipler plunges into technical regions of quantum mechanics (QM). He is a firm believer in what is called the "many worlds interpretation" of QM. All I need say here about this fantastic view is that it assumes the reality of a "multiverse" that contains an infinity of universes similar to our own. Millions of these parallel worlds contain exact duplicates of you and me. Tipler quotes Stephen Hawking as saying to him that the many worlds interpretation of QM is "trivially true."

If Hawking said this I think he meant that the many worlds interpretation is a useful language for talking about QM, but its infinity of parallel worlds are not "real" in the same way our universe is real. However, for Tipler they are very real. Denying the multiverse, he says "is the same as denying that 2+2=4" (Tipler 16).

Here is a typical paragraph about Jesus's Resurrection:

> I am proposing that the Son and Father Singularities guided the worlds of the multiverse to concentrate the energy of the particles constituting Jesus in our universe into the Jesus of our universe. In effect, Jesus' dead body, lying in the tomb, would have been enveloped in a sphaleron field. This field would have dematerialized Jesus' body into neutrinos and antineutrinos in a fraction of a second, after which the energy transferred to this world would have been transferred back to the other worlds from whence it came. Reversing this process (by having neutrinos and antineutrinos—almost certainly not the original neutrinos and antineutrinos dematerialized from Jesus' body—materialize into another body) would generate Jesus' Resurrection body.

Although Tipler has nothing to say about the resurrection of Lazarus and other revivals of the dead mentioned in the New Testament, presumably they have similar explanations.

Tipler also reveals, so help me, exactly how Jesus managed to walk on water. He performed this great magical feat by "directing a neutrino beam" downward from his feet. Similar neutrino beams account for his ascension into the clouds, as well as how his resurrected body was able to dematerialize and rematerialize. Mary's assumption is similarly explained: Tipler recommends checking her tomb for tracks of nuclear particles that would have been generated by her assumption. Apparently, Tipler thinks her corpse floated into heaven from her tomb rather than from a funeral procession as legend has it.

Chapter nine describes how physics explains the Incarnation, and how it also can account for the real presence of the Lord's body and blood in the bread and wine of the Catholic Eucharist.

I will spare the reader accounts of Tipler's belief that within fifty years computers will surpass human intelligence, and how our organic brains will be replaced by computer emulations as the universe moves inexorably toward the Omega Point. When that point is reached, an evolving God will become omniscient in the sense of knowing everything that can be known and omnipotent in the sense of being able to do everything that can be done. As Thomas Aquinas taught, there are things God cannot do, such as create a world that contains logically impossible things like a triangle with four sides or a creature that is both a perfect human and a perfect horse. It is best, Aquinas adds, not to say there are things God can't do, but that there are things that can't be done.

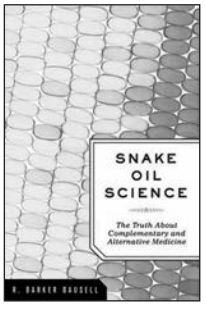
Before fifty years have ended, Tipler warns us, Armageddon will be fought with weapons that will make nuclear bombs seem like "spitballs" (254). There will be mass conversions of Jews to Christianity. Tipler dedicates his book

"To God's Chosen People, the Jews, who for the first time in 2000 years are advancing Christianity." After Armageddon, Jesus will return in glory to reign over a new Earth. How does Tipler know all this? Biblical prophecy says so! "Before the Second Coming," he writes (369), I would expect to see a Jewish Pope."

For a few moments, after finishing *The Physics of Christianity*, I began to wonder if the book could be a subtle, hilarious hoax. Sadly, it is not.

Note

1. Pannenberg was born in 1928 in what now is Poland. His best known works are *Jesus: God and Man* (1968) and a three-volume *Systematic Theology* (1994), both heavily influenced by Karl Barth. At



The Pervasive Placebo Effect

PETER LAMAL

Snake Oil Science: The Truth about Complementary and Alternative Medicine. By R. Barker Bausell. Oxford University Press. New York, 2007. ISBN 978-0-19-53168-0. 324 pp. Hardcover, $24.95.

An ad in a recent edition of the *Charlotte Observer* newspaper was headlined "Treating Mind, Body and Spirit." It touted a medical facility staffed by an MD who is a fellow in integrative medicine, an RN, and a "LAc, MSTOM" who is a diplomate of Oriental medicine. According to the ad, the facility blends "cutting-edge internal medicine with ancient and complementary therapies to deliver evidence-based holistic treatment. . . . Complementary therapies include meditation and massage, reiki and quantum touch, acupuncture, and much more."

In the November/December 2007 SKEPTICAL INQUIRER, Edzard Ernst introduced us to The Prince of Wale's Foundation for Integrated Health, a U.K. lobby group promoting "complementary healthcare." And, says Ernst, the foundation has powerful support, including that of the U.K. Department of Health.

Under pressure, primarily from Iowa Senator Tom Harkin, the U.S. National Institutes of Health (NIH) established an Office of Alternative Medicine, which became the National Center for Complementary and Alternative Medicine. The center started funding high-quality, well-designed clinical trials of complementary and alternative medicine (hereafter CAM) therapies. Bausell was the research director of an NIH-funded CAM specialized research center, where he was in charge of conducting and analyzing randomized clinical trials of acupuncture's effectiveness for pain relief.

The establishment of the National Center for CAM is an interesting development in light of the CAM community's discouragement of internal dissent based on the belief that the community was besieged from the outside and "that the validity of their therapies transcends conventional scientific methods altogether" (xii). This, says Bausell, is a contemporary version of the age-old phenomenon of the collision between science and belief.

The fundamental question Bausell addresses is whether or not CAM therapies work. The key to answering the question is the phenomenon of the placebo effect, which he considers "at least as interesting and counterintuitive as any New Age health practice" (xv). This book, says Bausell, is the first scientific evaluation of CAM. Most research on CAM has been poorly designed and executed. And poorly conducted research almost always produces false positive results, that is, that the CAM therapy under investigation is effective when in fact it is not.

But just what is CAM? It is the set of practices that continues to be used in the absence of both scientific evidence that supports the practices' efficacy and a plausible biological explanation for why they should be effective. Even worse, these practices continue to be used even after there is persuasive evidence that they are ineffective and their supposed biological basis is discredited. CAM practitioners do not value—and most, in his experience, says Bausell, do not understand—the scientific process.

Snake Oil Science is devoted primarily to the placebo effect. A placebo is a pharmacologically or physiologically inactive substance or procedure that can have a therapeutic effect if administered to a person who believes that he or she is receiving an effective treatment. To assess the efficacy of medical procedures and treatments, research must be designed to control for positive results that may be due wholly or in part to a placebo effect. The best type of research design involves random assignment of patients to a group that will experience the treatment under investigation, other patients to one or more groups that receive the placebo therapy, and another group that receives neither the treatment nor placebo. The best design also involves "double blinding," meaning neither the researchers nor the patients know which group any given patient is in.

According to Bausell, the most obvious problem involved in integrating research on CAM is that so much of that research appears to totally disregard or to be totally ignorant of the best

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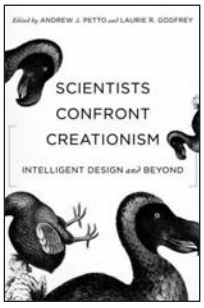
research practices and designs. "This abysmal lack of research quality" (Bausell 115) makes interpreting the results of any systematic review of CAM research extremely difficult.

Bausell devotes a chapter to each of the following topics: Impediments to Making Valid Causal Inferences; Impediments Preventing Physicians and Therapists from Making Valid Inferences; Impediments Preventing Poorly Trained Scientists from Making Valid Inferences. He illustrates the points primarily with fictional accounts of doctors treating patients' chronic pain with acupuncture, but CAM studies concerned with other health problems (e.g., high cholesterol, depression) and treatments are also cited. Another chapter is devoted to Judging the Credibility and Plausibility of Scientific Evidence. The goal is to determine if there is a CAM therapeutic effect over and above what can be attributed to a placebo effect—and if there is a CAM therapeutic effect, is there is a plausible biochemical mechanism that could explain it?

Supposed CAM therapeutic effects are a function of people's expectations and beliefs. "If we believe in CAM therapies, then they will most likely work for us. If they don't work for us, then we will find a reason for this failure and continue to believe in them—thereby prohibiting reality from conflicting with our beliefs" (125).

Snake Oil Science concludes with examples of "pathological science" and the deleterious role of the media. Media coverage of science is usually superficial and fails to deal with ambiguity and subtlety.

Bausell writes in an engaging style aimed at the general reading public. He includes chapter notes listing the published scientific work he drew upon. As a true scientist, Bausell consistently points out the limitations of the experiments he describes and discusses, including those that support the idea of the pervasiveness and power of a placebo effect.



Confronting the Foes of Candor and Knowledge

KENNETH W. KRAUSE

Scientists Confront Intelligent Design and Creationism. Edited by Andrew Petto and Laurie Godfrey. W.W. Norton and Co., New York, 2007. ISBN: 978-0-393-05090-5. 304 pp. Hardcover, $27.95.

When anti-intellectualism passes easily for anti-elitism and opposition to education masquerades as politically charged populism, both science and the societies it serves are in deep trouble. In America, fundamentalist religion and evolution have battled hard, especially for the precious minds of young public schoolchildren. Science has prevailed for the most part, at least on paper. But even as creationists persist in spreading the infection, scientists continue to misdiagnose the disease.

Empirico-rationalists of all inclinations and callings might do better to acquaint themselves with anthropologist J. Michael Plavcan's updated theory of "cognitive dissonance," for example. When a particularly crucial religious belief is flattened by frequent and heavy loads of disconfirming evidence, the devotee—rather than simply changing her mind—might attempt instead to reduce the dissonance between the evidence and the conviction, on a subconscious level, by buttressing the latter with seemingly endless rationalizations and pleas for group reinforcement, and on a conscious level, by actually intensifying her evangelical gusto. Good for her, perhaps, but not so good for her community or for any children she might influence along the way.

But the incorrigible biblical literalist might not renounce science completely. During a bizarre series of cognitive contortions, she might actually embrace it—or at least her peer group's perverted rendering of it. In fact, self-professed "creation scientists" have managed to anoint themselves as the disciples of Newton and "evolutionists" as his apostates. In their minds, up has indeed become down due simply to the desperate and terrible power of minds united in both muddled thought and psychic self-defense.

In reality, the fundamental distinction between science and creationism has scarcely changed over the past century. As Plavcan notes, true science is inherently self-correcting while creationism, mired in perceived absolute truths, is wholly incapable of rehabilitation. The two are obviously incompatible in the context of science education. But let's be completely frank. The contestants are reciprocally threatening as well, in as much as creationism undermines both truth and academic freedom, and insofar as science, along with other rational disciplines, exposes the absurdity of biblical literalism.

Given the acrimony, given the incalculable dissonance and the religious ideologue's typical response to it, no one should expect the controversy to simply resolve itself. Nor should we be surprised

Kenneth W. Krause is books editor for both Tapestry *and* Secular Nation *magazines. He has recently contributed to various national and international periodicals including* Skeptical Inquirer, The Humanist, Free Inquiry, Skeptic, Truth Seeker, *and* Freethought Today, *and to local publications including* Wisconsin Lawyer *and* Wisconsin Political Scientist. *He may be contacted at krausekc@msn.com.*

that young earth creationism continues to thrive despite its impossible claim that the universe, along with every species ever to have inhabited it, was divinely created only 6,000 years ago. With due respect to the late, great Stephen Jay Gould, the battle is and has always been unavoidable. As science historian Ronald L. Numbers admits in his essay outlining the extravagant saga of American creationism, "As long as the Bible remains the most trusted and widely read text in America and scientists maintain their considerable cultural authority, consensus seems unlikely, even if desirable."

Understandably, the front lines are usually drawn in public school classrooms. But as editors Petto and Godfrey emphasize in this welcome book, K-12 teachers can and should try to do only so much. In reality, the dispute between creationism and evolution is purely cultural. Creationist indoctrination, however, instructs a *scientific* controversy as well, creating popular confusion that—again, as a product of grossly perverted logic—springs from legitimate and, indeed, fortunate scientific disagreements over the relative significance of various evolutionary mechanisms. Although no scientific dispute over the fact of evolution exists, creationists routinely try to insinuate one from these genuine and often highly charged intra-disciplinary feuds.

Some scientific debates are better understood and more readily generalized and relatable than others, of course, including those between Richard Dawkins and Gould regarding gradualism versus punctuated equilibria and the proportionate consequence of natural selection and various other evolutionary media. So it is, too, with Lynn Margulis's model of endosymbiosis, which accounts for the origin of cellular organelles like mitochondria and chloroplasts and explains the emergence of eukaryotes from their prokaryotic forebears. These are among the issues that can be suitably summarized in typical high school biology textbooks.

But some evolutionary models are too complex for secondary school environments, including those relating to neutral mutation, transposable genes, and developmental evolution. Others are scientifically unsettled as well and therefore particularly vulnerable to creationist hyperbole and subterfuge. Carl Woese's theory of horizontal gene transfer, for instance, postulates an evolutionary—though *non-Darwinian*—explanation for the emergence of the first nucleated cells. Although it suggests limitations to the traditional Darwinian model, horizontal gene transfer arguably applies only to bacteria and Archaea and most certainly does not solicit, as creationists have claimed, a repudiation of evolutionary theory. Such discussions, though certainly fascinating for many and crucial in more advanced contexts, are clearly inappropriate for high school settings where teachers are trained simply to provide practical, well-rounded survey courses.

True science is inherently self-correcting while creationism, mired in perceived absolute truths, is wholly incapable of rehabilitation.

This leaves concerned citizens in a familiar predicament. What fate for society when it abandons education at the schoolhouse door? What will be the fate for the species when the larger community finds no qualified advocates for science? The American popular media, surely, have demonstrated little or no interest in their readers' broader sensibilities, much less in the larger society or ecology.

In the book's introduction, life scientist (and SKEPTICAL INQUIRER columnist) Massimo Pigliucci proposes a solution. Those most qualified must both take the lead and continue to carry the major burden, at least for now. University professors and researchers receive their generous salaries and grants from the public. So do sanitation workers, one might argue, but nobody asks them to engage the community's sense of outrage at people who, for example, refuse to cover their garbage cans. But the stakes are considerably higher in the scientific context where everything from disease control and prevention to species conservation and environmental protection are directly implicated. And if not professional scientists, Pigliucci asks, then whom? For each community's best and brightest, public outreach is "not merely an option," it is a "moral obligation."

Seventeen experts in the fields of anthropology, biology, genetics, geology, physics, and science history have apparently agreed, and in *Scientists Confront*, they join Pigliucci's effort to contest creationism in all of its major manifestations. Antonio Lazcano describes a variety of naturalistic means by which life might have first emerged. Kevin Padian and Kenneth Angielczyk reveal the fossil record's abundance and explain why we should think in terms of "transitional features" instead of "transitional forms." Robert Dorit shows us why complex causes, outcomes, structures, and organizations are completely predictable without resorting to a supernatural architect of the gaps, and Victor Stenger demonstrates why humanity is "fine-tuned" for the universe and not the other way around.

But serious nonfiction, alas, is entirely useless to serious nonreaders. Along with those who collect book royalties, those who receive authors' facts and ideas are equally obligated to confront the foes of candor and knowledge wherever they appear. For every appeal to seek answers in Genesis, there must be a citation to emergent complexity, Lucy and Toumai, or the molecular clock; for every glorification of God's alleged goodness, a theory of adaptive altruism; for every "Halleluiah!" a "Eureka!"; and for every self-deceiving evangelical, a rational and informed freethinker of confidence and courage.

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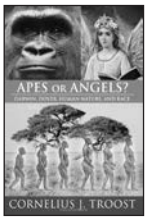
Listing does not preclude future review.



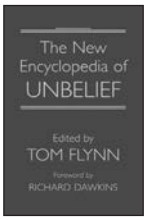
APES OR ANGELS? Darwin, Dover, Human Nature, and Science. Cornelius J. Troost. Authorhouse, Bloomington, Indiana, 2007. Softcover, $14.95. The title of this book alludes to the looming issue of human nature placed before the world by Darwin's two most influential books. Human nature is not fully understood, but its genetic foundation is under intense analysis by armies of researchers. Troost, a former professor of science education (UCLA) and chair of graduate studies (Brock University, Ontario) invokes evolution and good science throughout but also calls for more forthright consideration and understanding of the issue of race, which he considers a biological entity and a topic regrettably off-limits in modern inquiry.

BUY, BUY BABY: How Consumer Culture Manipulates Parents and Harms Young Minds. Susan Gregory Thomas. Houghton Mifflin, New York, 2007. 276 pp. Hardcover, $25. An investigative journalist examines how marketers exploit infants and toddlers and the broad impact of that exploitation on society. One key aspect is the baby genius phenomenon—the unsupported idea that infants and toddlers can be made smarter via exposure to the right products and media programs. With an educational "halo" around your product, you can pretty much get away with just about anything, one marketing executive admits.

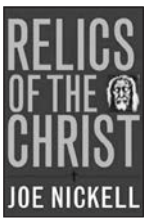
ENERGY FOR THE PUBLIC: The Case for Increased Nuclear Fission Energy. R. Stephen White. BookSurge Publishing (www.booksurge.com). 310 pp. Hardcover, $49.95. An emeritus professor of physics (University of California, Riverside) wrote this book to inform the public about its choices on energy policy issues and help it make realistic decisions based on knowledge of science. It gives broad context about energy science, including all forms of renewable energy, the California deregulation disaster, and transportation and energy. White argues that there are no scientific roadblocks to increasing nuclear fission's contributions to the production of electrical power, and that political and psychological reservations to nuclear energy, somewhat on the wane, can likewise be ameliorated.

IN GOD'S IMAGE: The Natural History of Intelligence and Ethics. Gerhard Meisenberg. Book Guild Publishing, Brighton, U.K. 2007. 404 pp. Hardcover, £17.99. A medical biochemist explains the processes by which the brain creates intelligent reasoning and judgments about the proper courses of action. All these processes are imperfect, because as he forthrightly states, we are imperfect products of three billion years of evolution, which has left us "little more than a bundle of cognitive reflexes." This cognitive toolkit produces predictable errors of reasoning and judgment, because our social instincts did not evolve for the benefit of objective knowledge but instead to give us an edge in the struggle for sex, mates, food, and money. Meisenberg goes on to explore the natural history of social behavior and moral intuitions and the gene-culture co-evolution that has taken place in past societies and continues today.

MADE TO BREAK: Technology and Obsolescence in America. Giles Slade. Harvard University Press, Cambridge, Massachusetts, 2007. 330 pp. Softcover, $15.95. If you've replaced a computer lately—or a cell phone, a camera, or television—chances are the old one still worked. And chances are even greater the latest model won't last as long as the one it replaced. Welcome to the world of planned obsolescence—a business model, a way of life, and a uniquely American invention that this book explores from beginning to end. The author is an independent scholar and writer.



THE NEW ENCYCLOPEDIA OF UNBELIEF. Edited by Tom Flynn. Foreword by Richard Dawkins. Prometheus Books, Amherst, New York, 2007. 897 pp. Hardcover, $199. An ambitious new and comprehensive reference work on the history, beliefs, and thinking of America's fastest-growing minority: those who live without religion. Two hundred of the field's foremost scholars describe and explain every aspect of atheism, agnosticism, secular humanism, secularism, and religious skepticism and provide biographical entries of major figures in the field throughout history. In his lively foreword, Richard Dawkins forthrightly addresses expected reservations about the title focus on "unbelief," describes several spectrums of unbelief, and argues that forsaking religion is liberating. Editor Tom Flynn also deals with those issues in his introduction and discusses why a new encyclopedia of unbelief matters.



RELICS OF THE CHRIST. Joe Nickell. University Press of Kentucky, Lexington, 2007. 215 pp. Hardcover, $27.95. The Committee for Skeptical Inquiry's senior research scholar examines the authenticity of numerous Christian relics, investigating not only the objects themselves but also the methods that were used to supposedly substantiate them. Nickell uses all the tools available, from science to historical investigation, to study the evidence for and against their authenticity. He draws on his own experiments as well as the work of the world's top scientists. Sections include: The Cult of Relics, Christian Relics, The Holy Grail, Self-Portraits of Jesus, The True Cross, Other Crucifixion Relics, Holy Shrouds, The Shroud of Turin, 'Photograph' of Christ, The *Sudarium* of Oviedo, Blood of Jesus, and the James Ossuary. Some portions of the book have previously appeared in the SKEPTICAL INQUIRER.

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Cool Careers for Dummies: Psychic Detective

PAUL DESORMEAUX

One of the highest-rated shows on Court TV's schedule of smart, legally oriented programming is *Psychic Detectives*. This is a weekly nonfiction show that's been running for about four years in which famous psychic sleuths help police track down killers and missing and murdered people through various scientific means, such as "catching some vibes" while staring at a missing person's picture, envisioning images—or hallucinating—while strolling through a crime scene, or developing a few "hunches" while fondling a victim's Rubik's Cube.

Often the popularity of an occupation on television drives the public to want to work in the same field. For example, viewers of CBS's *Ghost Whisperer* might want to find work as earthbound spirits someday. However, too often pursuing these attractive-looking jobs requires years of studying, lectures, exams, and beer pong. Well, the good news is you don't need no stinking college degree to become a famous psychic detective; a little unsound reasoning and chutzpah, which is a Yiddish word for "humongous gonads," is all that's required.

The psychic detective job description is fairly straightforward: assist police departments all over the world in solving murder cases and finding missing persons, sometimes while sitting in the comfort of one's own home. Occasionally, when business is slow and missing persons decide to take a couple of weeks off, psychic detectives may use this break in the action to chew the fat with regular dead people or dream up new ways of avoiding the Amazing Randi.

Of course, before deciding whether or not to pursue a specific occupation, it's important to know if there are jobs available. Since most police departments claim they would never consider using psychics to help solve crimes—although one survey indicates that anywhere from one-fourth to one-third of departments revealed they would consider using them—you would think job opportunities would approach the number zero, but let's look at the simple facts: If law enforcement didn't at least consider psychic information, *Psychic Detectives* wouldn't exist. And if police don't use psychic sleuths, well, how have the cops been solving crimes up until now? By themselves? Please. Trust me, the opportunities for psychic detective work are plentiful.

What situation would get a police department to call in a psychic? Most claim they use psychics only when a case has reached, excuse the pun, a "dead" end. To me, this is twisted logic. If I were heading a murder or missing-person investigation, I would bring the psychic in on the front end, so that the case could be resolved immediately. Solving crimes would be less messy and complicated if they didn't involve unreliable and time-wasting eyewitness testimony and DNA, fingerprint, and icky blood-splatter evidence.

Is the road to becoming a psychic detective a difficult one? Well, some of the barriers you can expect are the sourpuss skeptics, like Joe Nickell, Gary Posner, and their ilk, who may try to dissuade you from entering the field by insisting there's no evidence that any psychic detective has ever solved a single crime. This, of course, is preposterous. Apparently their research has never led them to the biographical TV series, *Medium,* which clearly contradicts their findings. Let's get with it, guys.

For those of you who can ignore these nattering nabobs of negativism and are still considering psychic detective work as a promising career, what follows are some basic scientific techniques that you can practice within your own home. This starter kit will lead you to proficiency in this burgeoning occupational field.

First, you must master the art of "retrofitting." Basically, this means that you must provide an amalgam of uselessly "logical" clues at the beginning of the investigation. As an example, let's say you're brought in to track down a missing grandfather. When asked by police about your impressions—or even if

Paul DesOrmeaux is a skeptical satirist whose writings offer a humorous perspective on all skeptical issues, great and small. He teaches college writing, including its connection to critical thinking, and he oversees the Rochester (NY) Skeptics group. He can be reached at skepticalfunhouse @gmail.com.

you're not asked—always provide them with common, standard clues, like head and chest problems and bodies of water and some kind of foliage and a number like 18, all of which can fit almost any situation. If the investigators eventually find that grandpa died of a heart attack while on a hotel toilet, you could claim a "hit" because he's near a body of water, there is plant life in and around the hotel, and he was 81 a couple of years ago! Uncanny, isn't it?

Additionally, you must be diligent. Unfortunately, as a psychic sleuth, every once in awhile you'll need to get off your ass and do some actual investigating. Let's say a wife has been reported missing by an unfaithful, sociopathic husband named Scott. Before contacting the police with your insights, it's a smart idea to study all the news stories about the case, as well as check any Internet stories and blogs and maps of the area. Also talk to some of the parties involved. When the police contact you, play dumb as though you know nothing about the case and then proceed to reveal your "visions," which might include the letters "SP" and H_2O. They will already be familiar with this information but will be impressed anyway because psychic detectives are not known for being devious and deceitful.

Also, learn to pile it on. In other words, pepper the professional investigators with as much "evidence" as your clever and imaginative mind can conjure up. If they're looking for a missing college coed, for example, blast them with the whole kit and caboodle, such as: the woods, a bumpy road, face stubble, a scar, a tattoo, random initials (BD or DB, order doesn't matter), a bunch of numbers, an oily smell, toe fungus, a rainbow of colors, chest and head injuries, circles and squares, sock puppets, a kidney stone, and go with the dark skin. If it's discovered that she was actually staying with a friend who sports a tattoo of Olive Oyl ("O"s are circles!), you're golden. The police department, which publicly refuses to use psychic detectives, doesn't want to look foolish when it's discovered they pulled you into the case, so they'll praise your "hit" and ignore your cacophony of misses.

After a crime has been solved, with which you had nothing to do whatsoever, there are still a couple of neat tricks you can draw upon to build up the reputation you've worked so hard to earn. First and foremost, exploit the gullibility of the public, which can be summed up in two words: Creation Museum.

Too often pursuing . . . attractive-looking jobs requires years of studying, lectures, exams, and beer pong. Well, the good news is you don't need no stinking college degree to become a famous psychic detective; a little unsound reasoning and chutzpah, which is a Yiddish word for 'humongous gonads,' is all that's required.

Convince people you were actually successful by insisting that muffs are hits. If the missing individual is not technically dead and buried as you had originally and convincingly reported, insist that he's spiritually "dead" because he's been "buried" under an avalanche of work. Follow this up immediately by pounding your fist on the table and yelling out, "Nailed it!" First, the general public, such as Larry King and Montel Williams viewers, embrace simplicity and will be too intellectually lazy (see Creation Museum) to challenge your special skill. They want to believe in you the same way they want to believe that their children aren't ugly.

Another neat gimmick is to present your "predictions" *after* a crime has been solved, but insist you predicted it beforehand. By "predicting" events after all the facts are in, you will be guaranteed 96 percent accuracy (even a sighted squirrel will miss a nut now and then) and impress the gullible media who will in turn feed the general public's insatiable appetite for possessing magical abilities once they learn how to develop them.

Finally, gain exposure on as many media outlets as you possibly can. Brag on and on about your successes to the mass media, which is to critical thinking what a Twinkie is to food. They will support you and promote your chosen career by highlighting your "hits." Since a clear majority of recent journalism graduates believe in ESP, they will save their investigative reporting skills for more heavy-hitting stories, such as chicken-wing-eating contests and stolen baby monkeys.

How will you answer those few skeptics who ask impertinent, irrelevant, and smart-ass questions about the inability to solve high-profile cases, such as: Who were Chandra Levy and Jon-Benet Ramsey's killers? Where is Natalee Holloway, Judge Crater, and Noah's Ark? And why was it so difficult to sniff out such obvious wackos as Charles Manson or the Unabomber? No problema. Just vacuously state that your specialty is low-profile cases and that you've helped police solve over five hundred other, more significant crimes (which they will cannily deny), then dismiss them by going into a trance while blurting out a few "clues," like "I see a square and he's got a toe disease and dark skin."

So, if you've got the right personality for the job—which means you can lie with a straight face, you're fine with fraudulent behavior, you have a basic understanding of probability, you can manipulate the masses to give you money, you're self-delusional, you've got an excess of chutzpah, and you can cleverly fend off narrow-minded, know-it-all skeptics—you, too, can be a successful psychic

FOLLOW-UP

The Trouble with the Trouble with Memetics

SUSAN BLACKMORE

Massimo Pigliucci's objections to memetics ("The Trouble with Memetics," September/October 2007) mostly misconstrue the basic idea of memes. So I'd like to explain where I think he has gone wrong and why memetics really could have a bright future.

Several of his arguments take the following form:

> Memes are not like genes in respect of X.
> Therefore the analogy between memes and genes is false.
> Therefore memetics is false.

But analogies between memes and genes need not be close. To see why, we must go back to the origin of the term *meme*. As Pigliucci himself explains, Dawkins invented the term to refer to a cultural replicator; that is, to information that is copied from person to person or person to artifact. This information (whether ideas, skills, habits, or stories) varies, and the variant forms are subject to selection, so this counts as a replicator. Genes and memes are both replicators and therefore should have much in common, but they are very different kinds of replicators, so we should expect many differences too. This means that analogies may help us in deriving hypotheses about the way the new replicator works but could also lead us astray if we expect them to be too close.

Pigliucci's first "X" is "there doesn't seem to be any distinction between memes themselves and the phenotypes they produce." Agreed—in many cases but not all. More interestingly, I think that memes are actually evolving this distinction right before our eyes. Think about it this way: genes have been evolving for about four billion years. Starting from very simple self-replicating molecules, they have ended up packaged inside elaborate vehicles with fabulously high fidelity, effective copying machinery involving accurate transcription, random variation, and a separation between the germ line (which is copied) and its phenotypic expression (which is not). Memes have been around for two million years at most, but now they are catching up very quickly indeed and are rediscovering such "good tricks" as separating out the replicator itself from the products it makes possible; a trick that, among other advantages, avoids the accumulation of errors and allows for easier redesign of phenotypes.

Changes in this direction can be seen all around us. Suppose someone sings a song and someone else copies it—in this case the song itself is copied and errors accumulate with multiple copying. Compare this with the modern process of writing the song down in musical notation and then printing lots of perfect copies. In this case the printed music is copied, not the song, so errors do not accumulate. Also the number of copies made depends on the popularity of the song, just as (in biology) the number of genes passed on depends on the success of a phenotype. The same can be said of learning to make pumpkin soup by watching someone do it as opposed to working from a printed recipe. Other examples include cars produced in factories, books printed in presses, and clothes fashions that spread by competition between factory produced items. In each case the instructions for making something are copied—not the thing itself. The same split occurs with software, such as Microsoft Word. This is copied with perfect fidelity in billions of computers around the world, but its success depends not on anyone seeing the code, but on the success of the documents it produces—this is a germ line/phenotype split if ever there was one.

Memes are already overtaking genes in their evolutionary innovations. Until now human brains (the original, slow and imperfect meme machines) have done most of the copying, varying, and selecting of memes, but now this is changing. Already, computers, especially via the Internet, do much of the copying, and they are beginning to take on the task of producing variants and even of doing the selecting (think viruses, crawlers, automated essays, but especially search engines). I believe that we can only understand what is going on here by taking a meme's eye view and being realistic about our own, diminishing, role in the process.

Among Pigliucci's other "X"s is that memes have no obvious physical basis, but this is simply wrong. They are information that is copied—whether as variations in the airwaves of human speech or as something hard to pin down like a dance or a vague idea or (increasingly) as digital information stored in physical systems.

I won't pretend that memetics is easy, but Pigliucci's objections will not do. I think we'll find that memetics' greatest strength lies in its vision of culture as a vast parasitic system evolving increasingly quickly and using us human meme machines as a resource for its own inevitable expansion. The way it devours the planet's resources without regard for the consequences is now our greatest challenge.

Susan Blackmore is a PhD psychologist, writer, CSI Fellow, and researcher on consciousness, memes, and anomalous experiences. Her book The Meme Machine *(1999) has been translated into twelve other languages. More recent books include the textbooks* Consciousness: An Introduction *(2003) and* Conversations on Consciousness *(2005).*

Author Response: Memes Concept Too Broad and Imprecise

According to Susan Blackmore, we have met the enemy, and it is the meme. They, not us, are sucking up the resources of our planet thus endangering the very existence of life on earth. Yet, it turns out that memes are little more than a general term for any idea, of any kind, that any human being has ever thought—from how to make cars to little annoying tunes. I'm afraid Blackmore simply validated my complaint that memetics is— at least at the moment—just too vague to be of any use in science.

Blackmore claims that by taking a "meme's eye view" of culture we can understand "what is going on," but in fact memes don't do any additional explanatory work over and above standard ideas about cultural evolution and gene-culture co-evolution. We are invited to think about Microsoft Word. As a staunch user of Apple products, I'd rather not, but if we must. . . . We are told that the success of the software doesn't depend on the users seeing the code (true enough, fortunately), but rather on the success of the documents it produces, something allegedly akin to the separation of somatic and germ line in biological systems (which, incidentally, exists only for some organisms—plants being a notable exception—and is therefore not a universal characteristic of life).

Really? I would have thought that the differential success of MS Word (relative fitness is what counts in evolution) compared to that of similar software actually depends on a host of human cultural phenomena, such as marketing, financial resources, legal systems, aggressive business tactics, and many others. But of course, I expect, all of those are memes themselves, right? And what accounts for their success?

The concept of memes is too broad and imprecise. It attempts to explain everything and thereby ends up explaining nothing—unlike, one must add, the concept of genes. Moreover, I still have yet to hear a functional ecology of memetics, without which the entire exercise is tautological ("successful memes are those that spread; the memes that spread are those that are successful"). Blackmore reconstructs my reasoning as an example of formal deduction, whereby I attempt to demonstrate that memes are a useless concept. That's much too high a bar and was not my intention.

Rather, my objections are based on the standard process of induction to the best inference, just like in any science: if you claim explanatory power for your theory, the burden of proof is on you to explain phenomena in a way that is both new and manages to go beyond merely restating the observations. Memeticists may get there, but they have a long way to go, and they don't seem to know which road to take in order to get there.

—Massimo Pigliucci

Massimo Pigliucci is professor of evolutionary biology and biology at Stony Brook University in New York.

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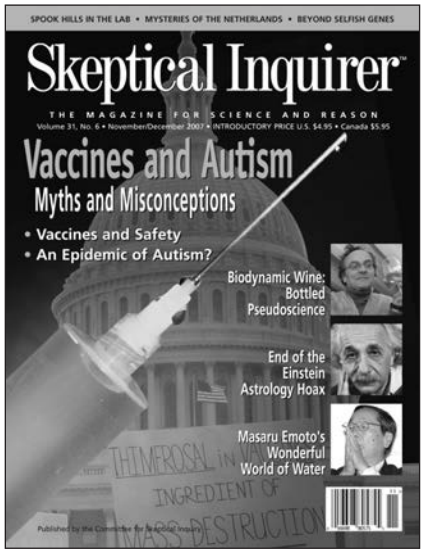
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Masaru Emoto's Wonderful World of Water
THIMEROSAL
INGREDIENT OF
MASS DESTRUCTION

Vaccines and Autism

Thank you for the three articles that address vaccines and autism in the November/December 2007 issue. We deal with these issues on a daily basis at the Centers for Disease Control and Prevention (CDC). Your articles are the best overview of this issue I have seen anywhere (plus they have the bonus of not having been written by the Government). I think these articles, primarily the ones written by Steven Novella and Richard Judelsohn, would be very useful for us as both clinician and public education tools. Your interview with Roy Grinker would also help dispel myths held by many parents. I have already ordered his book.

William Atkinson, MD, MPH
National Center for Immunization and Respiratory Diseases
Centers for Disease Control and Prevention

The November/December 2007 issue was excellent, but I have one important comment concerning Dr. Novella's otherwise accurate article. Dr. Novella states: "there is little doubt, and no controversy, that mercury, the major component of thimerosal, is a powerful neurotoxin, or poison to the brain." This strongly overstates the facts.

Mercury and its compounds can be classified according to their order of decreasing toxicity: methyl and ethyl mercury compounds (organomercury), mercury vapor (elemental mercury), and least toxic inorganic salts and a number of additional organic forms such as phenyl mercury salts (Dodes 2001). Thimerosal is an organomercuric compound.

Organomercury has caused severe poisonings, but even here the dose makes the poison. Birke and colleagues reported no symptoms of poisoning with levels of 0.8 mg of methylmercury (the most toxic form of mercury) per day for five years through the consumption of contaminated fish (Birke 1967).

Elemental mercury, the silvery liquid we used to play with as children, is only of concern as an inhaled vapor, since it is poorly absorbed through the GI tract and there are many cases of mercury being injected into the bloodstream when a rectal thermometer accidentally broke without any harmful effects. Here also, one would have to breathe quite a concentrated amount of mercury vapor over a long period to be affected. The National Institute for Occupational Safety and Heath gives a threshold limit value (TLV) of 50 micrograms per cubic meter of mercury vapor as a time-weighted average based on constant exposure of forty hours per week (Dodes 2001).

Therefore, the research shows that although organomercury in a sufficiently high dose can be extremely dangerous, the other forms of mercury are far more benign.

Thanks again for another wonderful and fascinating issue.

John E. Dodes, DDS
President, New York Chapter,
National Council Against Health Fraud

Steven Novella replies:

I agree with Dr. Dodes's summary—he goes into more detail about the various forms of mercury toxicity than was within the scope of my article. But what he is saying is not different than what I wrote in the original article. I specifically wrote that toxicity is all about dose, and Dr. Dodes makes essentially the same point.

Cognitive Dissonance

According to Tavris and Aronson, cognitive dissonance is "hardwired" (Comment and Opinion, SI, November/December 2007). Hardwired implies such thinking has a genetic base and is therefore found in all people in all cultures. This is unlikely!

One dictionary definition of dissonance is "discord," clearly a value term. Individuals are not born with value systems. Value systems are learned. Some of this learning may occur as soon as the human embryo's neurological system is functional in its uterine environment. For example, sounds in the mother's world (voices, music, etc.) are heard, thus becoming familiar to the unborn. When born, the child has some cultural knowledge of the outside world.

The roots of cognitive dissonance are embedded in the polymorphic values established by the cultural or subcultural milieu in which an individual was reared. Where else would a person acquire the baseline of what they believe and also learn when the boundaries of those beliefs are violated? Unless a person is aware of the influence that our cultural assumptions and value systems have in structuring our thinking, it is easy to conclude that everyone thinks alike.

Further, individuals in some cultures employ compartmentalized thinking and are fully functional while possessing competing value systems, e.g., Christian vs. Native beliefs. But only one system is operational at a time. These individuals can switch from one to the other without cognitive dissonance.

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Carol Tavris and Elliot Aronson reply:

We appreciate this comment. It is certainly true that culture plays a role in determining what *values and other cognitions will be considered dissonant—for example, nonreligious people do not experience dissonance when a central religious belief is contradicted by data, and apolitical people do not experience dissonance when a politician does something criminal. But the fact that all human beings are motivated to reduce dissonance—to justify important decisions, maintain important beliefs, and preserve their own self-concepts—has long been established in every culture where the theory has been tested. In fact, Yale researchers recently found evidence of postdecision dissonance reduction in preschoolers and nonhuman primates, concluding "that the mechanisms underlying cognitive-dissonance reduction may have originated both developmentally and evolutionarily earlier than previously thought." But as we emphasize in our book, although dissonance reduction may be hardwired, how we think about mistakes we make, and whether we learn to correct them, is learned.*

Biodynamics and Wine

Thanks to Douglas Smith and Jesus Barquín for the extensive research into subject matter and debunking yet another field where belief and esoteric practices are considered reality